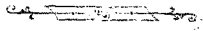


THE
COMPLETE
POULTRY BOOK.

By C. E. THORNE,
Associate Editor FARM AND FIRESIDE.



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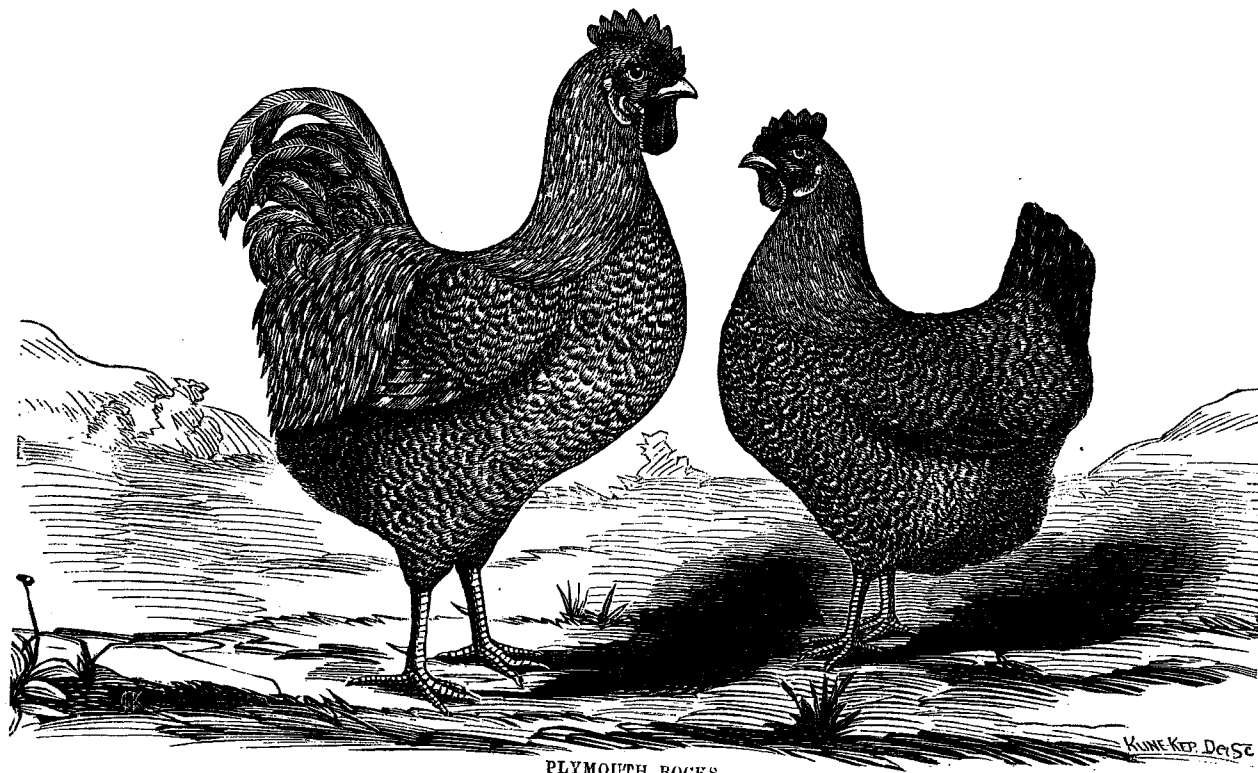
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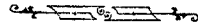


PLYMOUTH ROCKS.

THE
COMPLETE POULTRY BOOK.

A MANUAL FOR THE AMERICAN
POULTRY YARD.

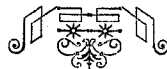
By C. E. THORNE,
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PREFACE.

The "Poultry Book," edited by W. B. Tegetmeier, and illustrated by Harrison Weir, is everywhere recognized as the standard authority on matters pertaining to poultry, and its descriptions, accompanied by Mr. Weir's excellent illustrations, have performed an invaluable service in fixing the types of the various breeds of fowls. The high price of this work, however, places it beyond the reach of the average American poulterer, while, moreover, it treats of the subject from an English point of view, and has little or nothing to say upon many questions which are of paramount interest here.

Of other English and American poultry books little can be said. They are often mere compilations from Mr. Tegetmeier's work, only departing from his text to admit gross inaccuracies, or to advertise the compiler's egotism.

In the compilation of this book, Mr. Tegetmeier's work has been used as the basis, and in many places his text has been closely followed, as shown by the marginal references. It will be found, however, that many important additions have been made, as in that portion of the chapter on the diseases of poultry which treats of fowl-cholera; in the description of the newer American breeds, and in many points relating to the care and management of fowls.

C. E. T.

THE POULTRY BUSINESS.

The poultry yard is generally regarded as one of the most insignificant parts of the farming business—frequently as more of a nuisance than anything else, only to be tolerated to satisfy the whims of the “women folks.” So firmly grounded is this opinion in the masculine mind that no effort is made to ascertain the real value of the poultry industry, and we turn in vain to the volumes of National and State statistics for information in regard to it. This being the case we may be pardoned for doing a little guessing at its probable status, mingling our guesses with such figures bearing upon the subject, either directly, or indirectly, as may be attainable. For this purpose we shall use chiefly the statistics of the State of Ohio, they being more complete than others which are accessible at this date.

From these and the National statistics we find that there are, in round numbers, about 200,000 farms in Ohio. Upon each of these farms it is safe to say that there will be found an average of a dozen fowls, or 2,400,000 fowls for the State. If two millions of these are hens, and they yield but sixty eggs each during the season, there should be an annual production of 120,000,000 eggs, or ten millions of dozens, worth, at ten cents per dozen, a round million of dollars. If to this quantity we add the value of the poultry consumed at home and sold in the markets, we should have at the lowest calculation half a million dollars more, making a sum equal in value to that of the total production of rye and barley together, the produce of 77,000 acres of land; one third as great as the value of the potato crop; more than half of that of the cheese; about one fourth that of the wool; about the same as that of the clover seed; one fourth greater than the combined productions of sorghum, maple molasses and sugar, and honey; and ten times as great as the value of the sweet potato crop, for the year 1879. If our estimate of the poultry product is extravagant in either direction it is in that of lowness. Certainly such an industry as this is worthy of attention.

It is true that the larger part of this poultry product is consumed at home; but it is none the less valuable on that account, for both the flesh and egg of the fowl are foods of the most nutritious and valuable kinds, and if their consumption were increased ten fold in our farmers' families, and that of salt pork and grease diminished in proportion, the annual saving in doctors' bills and the greater accomplishment of work consequent upon the improved health which would thus be obtained, would amount to more, in all probability, than the whole value of the poultry product now.

With regard to the value of eggs as food the editor of the *Boston Journal of Chemistry* says:

“Eggs, at average prices, are among the cheapest and most nutritious articles

of diet. Like milk, an egg is a complete food in itself, containing everything necessary for the development of a perfect animal, as is manifest from the fact that a chick is formed from it. It seems a mystery how muscles, bones, feathers, and everything that a chicken requires for its perfect development are made from the yolk and white of an egg; but such is the fact, and it shows how complete a food an egg is. It is also easily digested, if not damaged in cooking. Indeed, there is no more concentrated and nourishing food than eggs. The albumen, oil, and saline matter, are, as in milk, in the right proportion for sustaining animal life. Two or three boiled eggs, with the addition of a slice or two of toast, will make a breakfast sufficient for a man, and good enough for a king.

"According to Dr. Edward Smith, in his treatise on 'Food,' an egg weighing an ounce and three quarters contains one hundred and twenty grains of carbon, and seventeen and three quarter grains of nitrogen, or 15.25 per cent. of carbon and two per cent of nitrogen. The value of one pound of eggs, as food for sustaining the active forces of the body, is to the value of one pound of lean meat as 1584 to 900. As a flesh-producer, one pound of eggs is about equal to one pound of beef.

"A hen may be calculated to consume one bushel of corn yearly, and to lay ten dozens or fifteen pounds of eggs. This is equivalent to saying that three and one tenth pounds of corn will produce, when fed to a hen, five sixths of a pound of eggs; but five sixths of a pound of pork requires about five pounds of corn for its production. Taking into account the nutriment in each, and the comparative prices of the two on an average, the pork is about three times as costly a food as the eggs, while it is certainly less healthful."

One of the reasons why the poultry business has received no more attention is that it cannot be made a large business. The barn-yard fowl is so constituted that it does not thrive when massed in large numbers, but only reaches its highest perfection when allowed to follow the customs of its progenitors in the Indian jungles, and wander at will in small flocks. This peculiarity has prevented the profitable handling of poultry as a specialty, except in the way of breeding improved stock to be sold at fancy prices, since it has not yet been found possible to collect a large number of fowls into one management and maintain them in health, without a greater outlay than would be justified by the returns obtained. Under the conditions of ordinary barn-yard poultry-keeping the fowls gather most of their subsistence from materials which would otherwise be wasted; while the time occupied in their care, being chiefly that of otherwise unproductive members of the household, is not felt; consequently, whatever they may yield in the way of eggs and flesh is so much clear gain. When, however, the natural and waste supplies of food are exhausted; that is, the insects, weed-seeds and grass obtained upon the range, and the waste food picked up in the barn-yard, scratched out of the manure heap, or out of the waste thrown from the household table, an element of outlay begins to enter into the calculation which may become so great as to counterbalance all the profit obtained.

It is hoped that this book may be the means of suggesting such methods of economizing in the care and feeding of poultry, that these expenses may be so reduced as to render the enlarging of the flock on every farm, not only a justifi-

able, but a profitable step; at the same time we would not encourage any one to go into the business of raising fowls and eggs for market with the expectation of becoming suddenly rich at it. It is a business involving but little manual labor, and that of a light character, but it does require daily exercise in the open air; hence it is admirably suited for women, and for those who are infirm in health. To such it offers a small remuneration, and if combined with other light employments, as bee keeping, some branches of small fruit culture, and silk production, would afford a reliable means of support to many whose circumstances do not allow them to engage in more laborious employments.

We have in mind widows, who have been left with families of small children dependent upon them, but without any means of support except the needle; maiden ladies, whom life's lottery has left without a household mate and protector; persons of infirm health, who have neither the strength nor facilities for the severe bodily or mental exertion which is required in other branches of industry; the families of laborers, whose scanty earnings are but barely sufficient to feed and clothe the wife and little ones: All these, if so situated that they can have the use of a small tract of land, may greatly lighten the burdens of life by the keeping of poultry, and if we do not present this business in the glowing light that some enthusiasts do, it is that such as these may find in our book no incentives to extravagant anticipation, only to be followed by disappointment; but may be led to begin cautiously and work carefully until experience shall have taught them with the least possible loss—for experience teaches only by losses, or what is the same, by failures to attain possible gains—the most suitable methods for their estates and conditions.

The foregoing remarks apply simply to the breeding of poultry for flesh and eggs; the breeding of fancy poultry is a separate business, and one which requires special adaptitude for success, as well as a knowledge which can only be bought by experience. It is not a business to be picked up in a day, any more than the breeding of horses and cattle. The same principles underlie the whole theory of breeding, and these principles are only to be mastered by years of study and practice; therefore we would advise those of limited means who have aspirations in this direction, to begin with one or two varieties of fowls; learn their habits and needs, and increase their number only in proportion as this knowledge is obtained. It is a knowledge which cannot be obtained from books, although books may be of such assistance that no poultry breeder can afford to do without them; but the information which they give must be mingled with personal experience, and thus digested and assimilated before it can be of much practical value.

This business has grown to great dimensions within a few years, owing to the facilities afforded by the express companies for the interchange of fowls and eggs, by which they may be sent hundreds of miles with perfect safety, as far as the fowls are concerned, and with but little risk to the eggs. This business started with the introduction of the large Asiatic breeds, whose superior size and other desirable qualities made them generally attractive, and now we have, in the establishments of our fanciers, representatives of almost every breed of fowl known.

CHAPTER I.

ORIGIN AND HISTORY OF THE DOMESTIC FOWL.

With regard to the origin of the domestic fowl, Charles Darwin, in his *Variation of Animals and Plants under Domestication*, says, in speaking of the various species of *Gallus*: "The *G. Sonneratii* does not range into the northern parts of India; according to Col. Sykes it presents at different heights on the Ghauts two strongly-marked varieties, perhaps deserving to be called species. It was at one time thought to be the primitive stock of all our domestic breeds, and this shows that it closely approaches the common fowl in general structure; but its hackles partially consist of highly peculiar, horny laminæ, transversely banded with three colors, and I have met with no authentic account of any such character having been observed in any domestic breed. This species also differs greatly from the common fowl, in the comb being finely serrated, and in the loins being destitute of true hackles. Its voice is utterly different. It crosses readily in India with domestic hens, but the hybrids thus produced are almost absolutely sterile when crossed among themselves or with either parent. * * From these facts we may reject this species as being the parent of any domestic breed.

"Ceylon possesses a fowl peculiar to this island; namely, *G. Stanleyii*. This species approaches so closely (except in coloring of the comb) to the domestic fowl, that Messrs. E. Layard and Kellaert would have considered it, as they inform me, as one of the parent stocks, had it not been for its singularly different voice. This bird, like the last, crosses readily with tame hens, but the produce is sterile, and inherits the peculiar voice of *G. Stanleyii*. This species may then, in all probability, be rejected, as one of the primitive stocks of the domestic fowl.

"Java, and the islands eastward, as far as Flores, are inhabited by *G. varius* (or *furcatus*), which differs in so many characters—green plumage, unserrated comb, and single median wattle—that no one supposes it to have been the parent of any one of our breeds; yet, as I am informed by Mr. Crawford, hybrids are commonly raised between the male *G. varius* and the common hen, and are kept for their great beauty, but are invariably sterile.

"The last species to be mentioned; namely, *G. bankiva*, has a much wider geographical range than the three previous species; it inhabits northern India as far west as Sind, and ascends the Himalaya to a height of four thousand feet; it inhabits Burmah, the Malay peninsula, the Indo-Chinese countries, the Philippine Islands, and the Malayan archipelago as far eastward as Timor. This species varies considerably in the wild state. Mr. Blyth informs me that the specimens, both male and female, brought from near the Himalaya, are rather paler colored than those from other parts of India; whilst those from the Malay peninsula and Java, are brighter than the Indian birds. I have seen specimens from these countries, and the difference of tint in the hackles was conspicuous. The Malayan

hens were a shade redder on the neck and breast than the Indian hens. The Malayan males generally had a red ear-lappet, instead of a white one as in India; but Mr. Blyth has seen one Indian specimen without the white ear-lappet. The legs are leaden blue in the Indian, whereas they show some tendency to be yellowish in the Malayan and Javan specimens. In the former Mr. Blyth finds the tarsus remarkably variable in length. According to Temminck the Timor specimens differ as a local race from that of Java. These several wild varieties have not as yet been ranked as distinct species; if they should, as is not unlikely, be hereafter thus ranked, the circumstance would be quite immaterial as far as the parentage and differences of our domestic breeds are concerned. The wild *G. bankiva* agrees most closely with the black-breasted red Game breed, in coloring and in all other respects, except in being smaller, and in the tail being carried more horizontally. But the manner in which the tail is carried is highly variable in many of our breeds, for the tail slopes much in the Malays, is erect in the Games and some other breeds, and is more than erect in the Dorkings, Bantams, etc. There is one other difference; namely, that in *G. bankiva*, according to Mr. Blyth, the neck-hackles when first moulted are replaced during two or three months, not by other hackles, as with our domestic poultry, but by short, blackish feathers. Mr. Brent, however, has remarked that these black feathers remain in the wild bird after the development of the lower hackles, and appear in the domestic bird at the same time with them; so that the only difference is that the lower hackles are replaced more slowly in the wild bird than in the tame bird; but as confinement is known sometimes to affect the masculine plumage, this slight difference cannot be considered of any importance. It is a significant fact that the voice of both the male and female *G. bankiva*, closely resembles, as Mr. Blyth and others have noted, the voice of both sexes of the common domestic fowl, but the last note of the crow of the wild bird is rather less prolonged. * * * * *

"From the extremely close resemblance in color, general structure, and especially in voice, between *Gallus bankiva* and the Game fowl; from their fertility, as far as this has been ascertained, when crossed; from the possibility of the wild species being tamed, and from its varying in the wild state, we may confidently look at it as the parent of the most typical of all the domestic breeds; namely, the Game fowl. It is a significant fact that almost all the naturalists in India who are familiar with *G. bankiva*, believe that it is the parent of most or all of our domestic breeds. But even if it be admitted that *G. bankiva* is the parent of the Game breed, yet it may be urged that other wild species have been the parents of the other domestic breeds, and that these species still exist, though unknown, in some countries, or have become extinct. The extinction, however, of several species of fowls is an improbable hypothesis, seeing that the four known species have not become extinct in the most anciently and thickly populated regions of the East. There is, in fact, only one kind of domesticated bird; namely, the Chinese goose, or *Anser cygnoides*, of which the wild parent form is said to be still unknown, or extinct. For the discovery of new, or the re-discovery of old species of *Gallus*, we must not look, as fanciers often look, to the whole world. The larger gallinaceous birds, as Mr. Blyth has remarked, generally have a restricted range; we see this well illustrated in India, where the genus *Gallus*

inhabits the base of the Himalaya, and is succeeded higher up by *Gallophasis*, and still higher by *Phasianus*. Australia, with its islands, is out of the question as the home of unknown species of the genus. It is also as improbable that *Gallus* should inhabit South America as that a humming-bird should be found in the old world. From the character of the other gallinaceous birds of Africa it is not probable that *Gallus* is an African genus. We need not look to the western part of Asia, for Messrs. Blyth and Crawfurd, who have attended to this subject, doubt whether *Gallus* ever existed in a wild state even as far west as Persia. Although the earliest Greek writers speak of the fowl as a Persian bird, this probably merely indicates its line of importation. For the discovery of unknown species we must look to India, to the Indo-Chinese countries, and to the northern parts of the Malay archipelago. The southern portion of China is the most likely country; but as Mr. Blyth informs me, skins have been exported from China during a long period, and live birds are largely kept there in aviaries, so that any native species of *Gallus* would probably have become known. Mr. Birch, of the British Museum, has translated for me passages from a Chinese encyclopedia, published A. D. 1609, but compiled from more ancient documents, in which it is said that fowls are creatures of the West, and were introduced into the East (that is, China) in a dynasty 1400 B. C. Whatever may be thought of so ancient a date, we see that the Indo-Chinese and Indian regions were formerly considered as the source of the domestic fowl. From these several considerations we must look to the present metropolis of the genus, namely, to the south-eastern parts of Asia, for the discovery of species which were formerly domesticated, but are now unknown in the wild state; and the most experienced ornithologists do not consider it probable that such species will be discovered.

"Purely bred Game, Malay, Cochins, Dorking, Bantam, and, as I hear from Mr. Tegetmeier, Silk fowls may frequently or occasionally be met with, which are almost identical in plumage with *G. bankiva*. This is a fact well deserving attention, when we reflect that these breeds rank among the most distinct. Fowls thus colored are called by amateurs 'black-breasted reds.' Hamburgs properly, have a very different plumage; nevertheless, as Mr. Tegetmeier informs me, 'the greatest difficulty in breeding cocks of the golden-spangled variety is their tendency to have black breasts and red backs.' The males of white Bantams and white Cochins, as they come to maturity, often assume a yellowish or saffron tinge; and the longer neck-hackles of black Bantam cocks, when two or three years old, not uncommonly become ruddy; these latter Bantams occasionally 'even moult brassy winged, or actually red shouldered.' So that in these several cases we see a plain tendency to a reversion to the hues of *G. bankiva*, even during the lifetime of the individual bird."

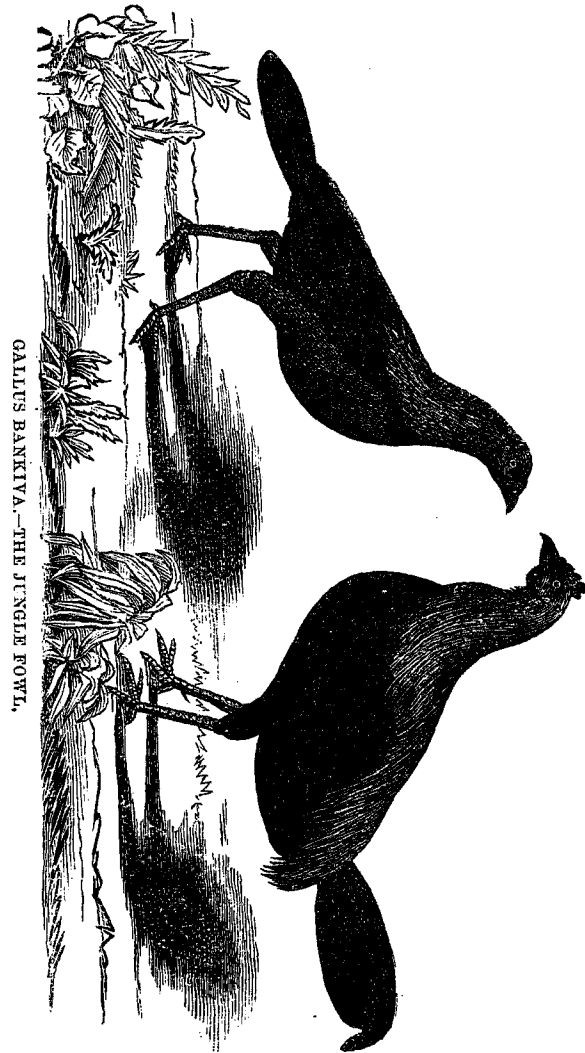
With regard to the history of the fowl Mr. Darwin says further:

"Rutimeyer found no remains of the fowl in the ancient Swiss lake-dwellings. It is not mentioned in the Old Testament; nor is it figured on the ancient Egyptian monuments. It is not referred to by Homer nor Hesiod (about 900 B. C.); but is mentioned by Theognis and Aristophanes between 400 and 500 B. C. It is figured on some of the Babylonian cylinders, of which Mr. Layard sent me an impression, between the sixth and seventh centuries B. C., and on the Harpy Tomb in Lycia about 600 B. C., so that we may feel pretty confident that the

fowl reached Europe somewhere near the sixth century B. C. It had traveled still further westward by the time of the Christian era, for it was found in Britain by Julius Cæsar. In India it must have been domesticated when the Institutes of Manu were written; that is, according to Sir. W. Jones, 1200 B. C., but, according to the later authority of Mr. H. Wilson, only 800 B. C., for the domestic fowl is forbidden, while the wild is permitted to be eaten. * * *

"Sufficient materials do not exist for tracing the history of the different breeds. About the commencement of the Christian era, Columella mentions a five-toed, fighting breed, and some provincial breeds; but we know nothing more about them. He also alludes to dwarf fowls; but these cannot have been the same with our Bantams, which, as Mr. Crawford has shown, were imported from Japan into Bantam in Java. A dwarf fowl, probably the true Bantam, is referred to in an old Japanese encyclopedia, as I am informed by Mr. Birch. In the Chinese encyclopedia above referred to, seven breeds are mentioned, including what we should now call jumpers or creepers, and likewise fowls with black feathers, bones, and flesh. In the seventeenth century Aldrovandus describes seven or eight breeds of fowls, and this is the most ancient record from which the age of our European breeds can be inferred."





GALLUS BANKIVA.—THE JUNGLE FOWL.

CHAPTER II.

THE REARING OF CHICKENS.

THE EGG.

All animal life has its beginning in the egg. In the mammals this egg is hatched within the body of the mother, and the young animal attains to a greater or less stage of development there before being thrown upon the cold charities of the world. Among most other orders of animals, however, the egg, after being charged with a supply of nutriment sufficient to carry its inhabitant to a stage of growth from which it may proceed with but little external assistance, is removed from the body, and the life within it awakened or destroyed by the circumstances with which it finds itself surrounded.

The essential part of the egg is the *vitellus*, or yolk, which, in its simplest form, is simply a globular mass of oily and albuminous matter, surrounded by a colorless, transparent, homogenous membrane—the *vitelline membrane*. In the hen these yolks may be found as a mass of yellow balls (*ovules*) of all sizes, those most nearly developed being nearly an inch in diameter.

These yolks, or yelks, are arranged in consecutive layers, as may be seen by cutting through a hard-boiled egg. In addition to the purely chemical elements which constitute their oil and albumen, they contain the life-germ of the future chick, which may be seen as a small, circular speck on top of the yolk upon breaking the egg into a basin. This speck is constantly kept on top of the yolk through the agency of gravity, it being lighter than the rest of the egg, while opposite it is found a comparatively dense mass of albumen called the *Chalazæ*, which serves as a ballast to keep the germ uppermost on whichever side the egg may be laid.* By this arrangement the germ is kept constantly near the breast of the hen, in such a situation as to most promptly receive the warmth of the hen, and to avoid the injury to the growing embryo which would result from the pressure of the heavy mass of the yolk.

These life-germs exist in all eggs, but the contact of the male element, or sperm, is required to give them vitality. Without that contact the bird's egg is simply a lump of inanimate matter, doomed to destruction. With it, this same lump of matter becomes endowed with that wonderful and incomprehensible thing, the life-principle, which renders this inanimate egg capable of building its particles together into the perfectly formed, living chick; which gives the seed the ability to develop into the full grown plant or tree, which brings forth bud and flower with every spring-time, and of which Professor Tyndall, the man who has been so widely aspersed because the revelations which he has read from the wonderful book of Nature do not coincide with the interpretations which doctrinaires have ignorantly put upon the equally wonderful Word, has said, in speaking of atoms:

*Tegetmeier.

"The way in which these atoms build themselves together is to me perfectly astonishing. You have here a play of power as wonderful as vitality itself. And depend upon it, trust me, the revelations of science are not in the least degree calculated to lessen our feelings of astonishment. We are surrounded by wonders and mysteries everywhere. I have sometimes—not sometimes, but often—in the spring-tide—watched the advance of the sprouting leaves, and of the grass and of the flowers, and observed the genial joy of opening life in nature, and I have asked myself this question: 'Can it be that there is no being nor thing in nature that knows more about these things than I do? Do I in my ignorance represent the highest knowledge of these things existing in the universe?' The man who puts that question to himself—if he be not a shallow man, if he be a man capable of being penetrated by profound thought—will never answer by professing the creed of atheism, which has been so lightly attributed to me."

As the yolks pass through the lower portions of the generative passages the "white of egg," which is pure albumen and water, is deposited around them in layers, the outermost of which is surrounded by two fibrous membranes, the "shell membranes." These membranes adhere closely together throughout most of their extent, but at the larger end of the egg they separate so as to form a small vesicle, the "air bladder." Outside of these membranes is formed the shell, which is a consolidated layer of the carbonate of lime, the same substance that exists in other forms as marble, chalk, etc. This layer is deposited in such a manner as to give the greatest possible strength for the material used, and at the same time is so arranged as to leave numerous pores, or breathing places, through which the water of the egg may evaporate, and the external air penetrate to support the respiration of the growing chick, or to set up the processes of decay by which eggs are so soon addled when exposed to the action of the atmosphere.

When the egg is subjected to a continuous heat of a little more than one hundred degrees, the germ, if it has been fertilized, soon begins to increase in size, and within twenty-four hours small blood-vessels may be seen forming a beautiful zone around it. If the heat be maintained, with proper conditions of moisture, these blood-vessels will continue to extend, until by the third day they will have commenced the formation of a temporary membrane, lining the shell membranes and called the *allantois*, which gives rise to that opacity shown in fertile eggs that have been sat upon. This membrane serves as the lungs of the growing embryo, which absorbs the contents of the egg and converts them into blood, which is aerated by exposure in the vessels of the *allantois* to the oxygen of the air that penetrates through the pores of the shell. This work goes on more and more actively until the nineteenth day of incubation, by which time the lungs of the embryo chick will have so far developed that they begin to perform their proper function, and its beak will have ruptured the air vesicles at the large end of the egg, which has considerably increased in size through the evaporation of the water from the albumen of the egg. At this time a peculiar tapping-like sound may be heard by placing the egg to the ear; this has been commonly ascribed to the pecking of the chick against the shell of the egg, but it has been shown to be due to the respiratory action of the lungs of the young chick.*

About the end of the twenty-first day of incubation—a few hours sooner with

*Tegetmeier.

fresh eggs, a few hours later with stale ones—the chick will break the shell, and will soon emerge.

The egg is thus seen to contain every element, except oxygen, necessary to the formation of the living chick; the flesh, blood and bone; the horn of the beak, claw and quill; the plume of the feather, the various internal organs, and the digestive fluids.

With this review of the constitution of the egg, its nature and the best methods of managing it may be more easily understood. Thus the processes for preserving eggs depend upon the porous construction of the shell, the point necessary to be attained being the complete exclusion of the air; which may be accomplished by coating the shells with oil, grease or wax, or by immersing the eggs in a thin, creamy mixture of lime and water. Simply sealing the eggs in air-tight jars will prevent their decay for a considerable time, and where it is desired to preserve them for hatching purposes, this method should be employed in preference to filling the pores with oil, etc., as it is necessary to the growth of the embryo that these pores should be kept open.

The peculiar construction of the egg-shell gives it such strength that a man may exert all his force upon it without breaking it, by placing it endwise between the palms of his hands and applying the force equally at all points; hence eggs may be packed in barrels, boxes or baskets, and shipped long distances without injury, provided they be surrounded by some elastic material, as oats, bran, cut hay, etc., thoroughly packed around all sides, so that they cannot come in contact with each other. This fact, and the peculiar internal construction of the egg, the yolk and albumen being surrounded by separate membranes, and the germ so perfectly balanced, rendering the mixture of these parts impossible, make the shipping of eggs for hatching purposes so feasible that they are annually sent in large quantities hundreds and thousands of miles, through the express companies, being simply packed in light boxes, or preferably in baskets with handles; a layer of bran, oats, sawdust, or, best of all, finely cut hay or straw, being placed in the bottom of the basket; the eggs placed on end on this, and surrounded with the packing material in such a way that they will not touch, and the whole held in place by a cloth cover sewed to the sides of the basket.

INCUBATION.

In the management of incubation, whether natural or artificial, we may learn much from the habits of the hen that is allowed to follow her natural instincts; thus, her nest is generally located upon the ground, under the shelter of a fence-row or thicket, and secluded as much as possible from intrusion; the earthy floor of the nest, being non-conductive of heat, retains that imparted from the body of the hen, while its moisture, together with that gathered by the hen during her early morning excursions for food, prevent an undue evaporation of the water of the egg. The eggs are never disturbed by turning or other handling, and when the embryo matures into a chick it pecks its way out of its stony cell without any other help than its own instinct and that of its hen-mother. The success of this method of incubation is proverbial, and he who can secure as large a percentage of chicks from his eggs under any method of management, as does the hen that thus steals her nest, may be well satisfied.

In carrying into practice the suggestions thus received from nature, we should endeavor first to secure eggs as freshly laid as possible, since those which have been laid for some time will not hatch so promptly nor produce such thrifty chicks as those more recently laid; the eggs should have been laid by young and thrifty fowls, as there will be a large per cent. of infertile ones, while the chicks produced will be of weak constitution, among eggs laid by old hens, and especially among those fertilized by old or puny cocks; the nests for the sitting hens should be located upon the ground if possible, or if this be impracticable, a few shovelfuls of earth, or a piece of sod, should be put in the bottom of the

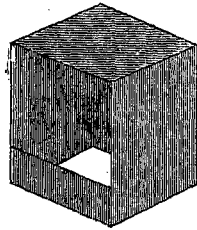


FIG. 1.

the nest-box, arranged in the form of a nest, and covered with cut hay or straw, or with leaves. The nest-box should not be so deep but that the hen can leave it without disarranging her eggs—Fig. 1 represents a good form—and should be so arranged that other hens may be excluded; otherwise there will be continual quarreling, resulting in the breaking of eggs and the laying of fresh ones which will not hatch in season, and will thus be destroyed.

In Fig. 2 we illustrate a hatching-coop for use where very early chickens are desired. The coop is four feet long, three feet wide and four feet high, being made large enough to give ample ventilation when closed. The nest is made in one corner of the coop, or two hens may be set in opposite corners at the same time, and when the chicks are hatched they may be confined in the coop when necessary. The sash is 3x4 feet in size, and may be raised or removed entirely when desired.

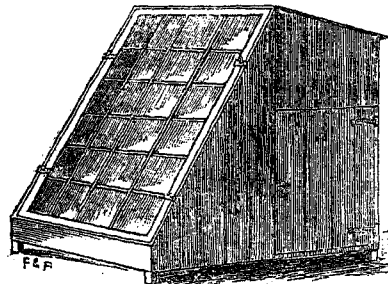


FIG. 2.

Where several hens are sitting at the same time, it is well to have each nest connected with a covered run-way, in which food and water may be placed for the hen, and which will prevent her returning to the wrong nest, or being disturbed by the attempts of other hens to lay to her. Such an arrangement is shown in Figs. 3 and 4, which represent the plan of a sitting-house contrived by a correspondent of *Farm and Fireside* from Hillsdale, Pa., who writes under the nom de plume of *Keystone*:

"This house is made for fifty hens, and is twelve feet long, from east to west, by eight feet wide, from north to south. There are doors at the east and west ends, and sliding glass windows, six by eight feet in size, in the south side. Boards six feet long by one foot wide are set on edge under the north side, in such a way as to form boxes one foot square inside the house, and one foot by five feet outside.

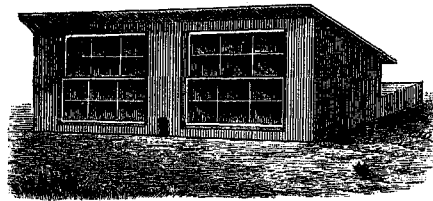


FIG. 3.

The inside boxes are used for laying and hatching, and are connected by doors with the outside boxes, which are used for feed-boxes, and are covered with laths nailed so close together that the young chick cannot get out. The inside boxes have lids, which are shut down when the hen is set, and the door to the outside box is then opened. Feed, water, gravel, etc., are placed in the outside box, and the hen will thus be able to help herself without being interfered with by other hens."

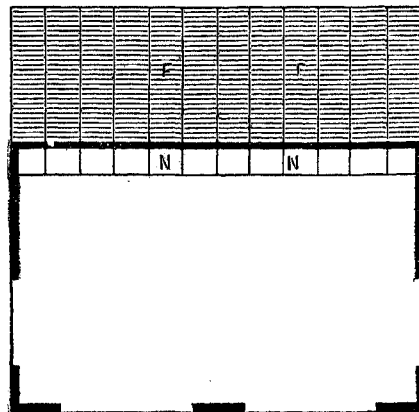


FIG. 4.

Lice sometimes become so troublesome as to drive sitting hens from their nests. On this account a nest-box should never be used a second time without thorough cleansing and whitewashing, or fumigating with tobacco smoke. Should the hen become lousy, sulphur or pyrethrum may be dusted under her feathers, but no

grease should be used, as it will get upon the eggs and prevent them from hatching by closing the pores. The placing of tobacco stems among the litter with which the nest is made has been found beneficial. Flowers of sulphur is also used in the same manner.

The disinclination of the hen to sit anywhere but in the nest which she has first chosen may be overcome, and the visits of intruders prevented, by the use of a door of coarse wire netting, which will be found serviceable for many purposes in the poultry-yard. If the hen cannot be permitted to forage at will,

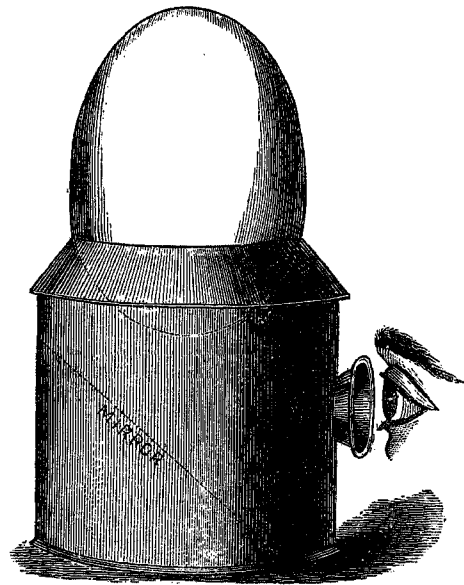


FIG. 5.

food and water should be placed within reach, and her eggs should be occasionally sprinkled with water. The turning of the eggs to cause them to be evenly heated is entirely unnecessary, but if any should by any accident be broken, those remaining should be washed in tepid water, to prevent the clogging of the pores of the shells.

On the eighth or ninth day of incubation, the fertility of the eggs may be tested by holding them between the eye and a bright light, or more certainly by means of the "egg tester" shown in Fig. 5, which represents a tin cup three inches high and two and a half in diameter, narrowed at the top so as to leave a round opening of such size as to admit the end of an egg, and having an oval mirror fastened at an angle of forty-five degrees with the axis of the instrument, as

shown by the dotted line, opposite which, and one inch above the bottom of the cup, is an opening one fourth of an inch in diameter and furnished with an eye piece. Enough light will be transmitted through the egg, if it be infertile, to form a distinct image of the yolk upon the mirror, while if the egg be fertile the allantois will have extended over the inner surface to such an extent as to render the whole opaque. Experience will enable one to decide upon the fertility of the eggs as early as the fifth or sixth days of incubation, at which time those withdrawn as infertile may still be used for certain culinary operations, while those which have been set upon for eight or ten days may be used advantageously in the food of the young chicks.

Further than this, all handling of the eggs should be avoided, and when they begin to hatch, especially, they should be let alone. A chick that has not strength enough to work its way out of the shell will not be worth anything after it gets out; while attempts to assist it are likely to do more harm than good, by prematurely rupturing the blood-vessels of the allantois, which corresponds in this respect to the after-birth in animals, and this may cause the chick to bleed to death. The chicks should be left in the nest until the hen leads them off, unless there has been so great a difference in the age of the eggs as to cause a number of them to be many hours later than the rest in hatching, in which case it may be necessary to remove them to prevent the hen from leaving the nest. The better plan, however, is to confine her there, giving her food and water (the young chicks will need nothing during the first day), and leave the chickens with her, as they will not thrive so well anywhere else as with the hen.

CARE OF THE CHICK.

The young chick, when first hatched, has just filled itself with the egg yolk, and will need no other food until that is fully digested, or from twelve to twenty-four hours. As the first food of the young human or quadruped is its mother's milk, so there is no other food so suited to the wants of the newly hatched chick as that which has heretofore sustained it, or eggs. To give this food in the best condition beat up an egg with two tablespoonfuls of milk and set it in a

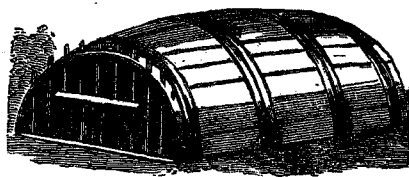


FIG. 6.

warm place until it coagulates, or "sets" into a custard, and feed it in this condition. This is much better than boiling it hard. This food should be continued for three or four days, adding gradually a larger and larger proportion of bread crumbs soaked in sweet milk,—(sour food is injurious to young chickens, hence only so much should be given as will be eaten clean at each feed),—and of oat meal, or a mixture of bran, oat meal and Indian meal, scalded and fed cold.

If the chickens are confined in coops a very little finely chopped meat should be given once a day,—a piece as large as a walnut will be sufficient for a dozen chicks—and also some form of green food, as chopped grass, cabbage leaves, or lettuce. Whether confined or not a little cracked corn or wheat screenings should be added to their food after they are a few days old, and the quantity

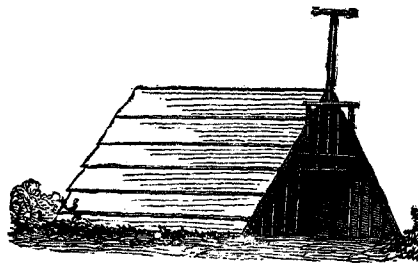


FIG. 7.

gradually increased as they grow older. Soaked bread should only be given in very small quantity, as it tends to produce diarrhoea. Milk should be given but sparingly at first, and then only in the shape of cottage cheese, but the quantity may be increased as they grow older, and for fowls two months or more of age it may be given sweet or sour, and will be found a cheap and acceptable food.

If the hens are quiet, and other circumstances do not forbid, the chickens will be more thrifty if allowed to range at will; but if the hens are inclined to take

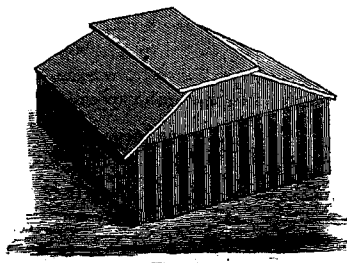


FIG. 8.

them so far from the house as to worry them out, or to expose them to hawks and vermin, or if neighbors are so close as to render confinement necessary to prevent trespass, it may be necessary to coop the hen. In this case the coop should be located upon grass land if possible; but it will be found an advantage to have a plot of plowed land near by, by stirring which occasionally, and placing the coops upon it in dry weather, the chickens will soon be taught to hunt for worms. The coops should be moved daily, as the souring of the food and the

excrement of the chickens very soon renders the ground under them a propagator of disease. Fresh water should be given daily, and if given in shallow iron dishes or in dishes containing iron scraps, the rust which forms will be beneficial to the chickens in preventing disease. No straw should be placed under the coops, as the young chicks will be more liable to become entangled in it and

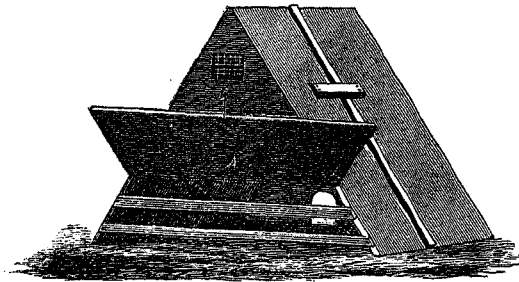


FIG. 9.—Coop with Floor.

trampled by the hen. It will be well, however, to place fresh sand or sifted ashes under them frequently, especially if they cannot be moved every day.

In Figs. 6 to 12 we give several designs for coops. Fig. 8 represents a square box without top or bottom, three sides being made of common barn-boards twelve inches wide by two feet long, and the fourth side slatted with plastering lath. The cover is made of three pieces of barn-board, each twelve inches wide by thirty inches long, nailed to two gables cut out of six-inch fencing. The

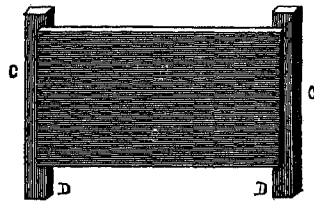


FIG. 10.

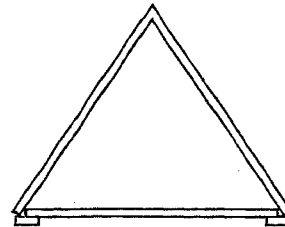


FIG. 11.

whole is made of pine, and is very light and convenient. Fig. 9 represents a triangular coop made with a floor and door in order to exclude rats. The manner of making and using the floor is shown in Figs. 10 and 11. The same floor may be used in the coop first described, and a door may be made to slide in behind the slats. A hen-coop should never have a floor in it if it can be avoided, however, as it is necessary to the health of both hen and chickens that they should have access to the ground. If a floor is used it must be frequently cleansed; if there

be no floor this cleansing is effected by moving the coop to a fresh spot each morning, by which means the hen may be furnished daily with fresh grass, which she needs.

Figs 12 and 13 give designs for coops where it is desirable, on account of hawks, cats, or for other reasons, to confine the chicks as well as the hen.

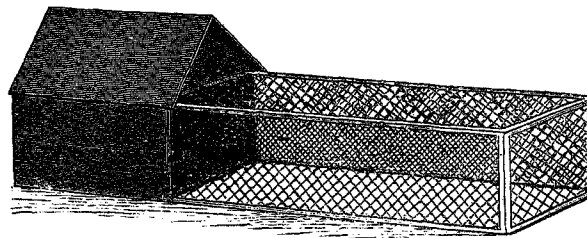


FIG. 12.

In Fig. 12 the runway is latticed with lath, wire or twine. In Fig. 13 with lath, although either of the other materials may be used here also. Twine netting is made for these purposes, being tarred for outside work. It is cheap and very convenient, especially when more than one breed of fowls is kept. By its use portions of the lawn or garden may be temporarily set off to the use of the

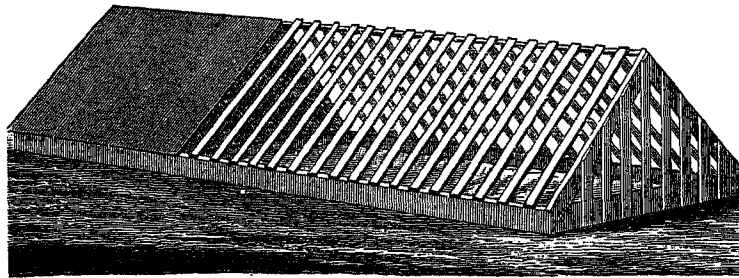


FIG. 13.

fowls, while the tarred netting may be advantageously used in the more permanent divisions of the poultry-yard.

Whether the hens be cooped, or allowed to run at large, a feeding-pen should be provided for the chicks when they are a few weeks old. For this purpose the pen shown in Fig. 14 will be found very convenient. To make it, get out fourteen strips one inch thick by two inches wide and six feet long; upon the edges of

these strips nail plastering laths cut to half lengths (two feet), so as to make seven hurdles, each two feet wide by six feet long, nailing the laths one and one half inches apart. Set four of these hurdles together so as to make a square pen, tying them or nailing them together at the corners, and cover this pen with the

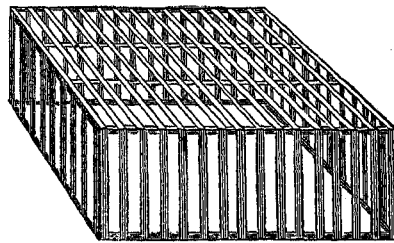


FIG. 14.—Feeding Pen.

remaining three hurdles. This will make a pen in which the chicks can be fed without being robbed by the greedy hens or the larger chickens, and the little fellows will soon learn to run to it when called. These hurdles will also be found very convenient for making the covered runways shown in Figs. 12 and 13.

DISEASES AND ENEMIES OF THE YOUNG CHICKEN.

The young chick has little to fear from *disease*, if it be properly fed and housed. Its worst enemy is the gapes, which is not a disease, but a result of the irritation caused by a parasitic worm, *Sclerostoma syngamus*, which finds its way into the windpipe and so impedes respiration until it finally causes death. The complete history of this parasite has not yet been ascertained. It is of a reddish color; the female is five eighths to three fourths of an inch in length, the male about one eighth. In a gaping chicken these worms may be found to the number of three to six or more pairs, and the body of the female will be found to contain ova of various stages of development, up to the completely grown embryo. It would seem that these worms must have another stage of existence, either in the body of some other insect or animal, or in the soil, but this point has not been investigated. The probability is, however, that this stage is passed in the soil, and that they are capable of existing there in the pupæ state until awakened into life again by being taken into the stomach or lungs of the bird. The gapes seems to be more troublesome on a moist soil, and in this it shows a similarity to the disease called Paper-skin in sheep, which is caused by the presence of a thread-like worm, *Strongylus filaria*, in the bronchial tubes of that animal, and which, like the sclerostoma, passes from our knowledge after leaving the body of its host.

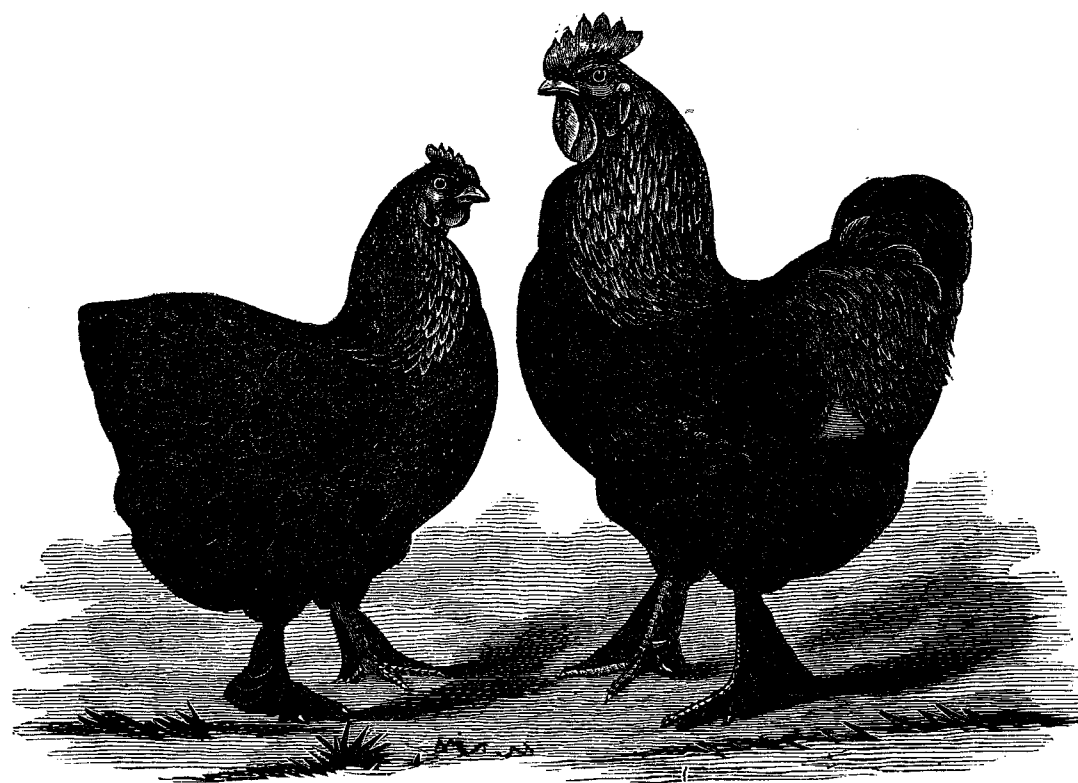
The remedies for the gapes are several. The worms may be removed by making a loop of horse-hair, introducing it into the windpipe of the chicken, giving it two or three twists, and withdrawing it. A still more satisfactory method is to take a feather, strip off the web to within half an inch of the end, moisten, insert

to the bottom of the windpipe, and withdraw as before. If the feather be dipped in kerosene, turpentine, or a weak solution of carbolic acid, such worms as are not caught will be killed, and immediately sneezed up by the chicken. Another method is to fumigate with sulphur or carbolic acid, to accomplish which, place a hot brick in the bottom of a box, cover it with a board having an inch augur-hole in the centre (the board is to prevent burning the chickens' feet), and through this augur-hole drop upon the hot brick a teaspoonful of flowers of sulphur, or a few drops of carbolic acid; put in the chickens, and cover the box for a few seconds. This must be done very carefully, or the chicks as well as worms will be killed. Still another method, recommended by correspondents of the *Poultry World*, is to confine the chickens in a small box, with a coarse cotton or linen cloth stretched over the top. Upon this cloth place a quantity of finely pulverized lime, and with a stick gently tap the cloth, so that the lime-dust will sift through. This will cause the birds to sneeze, and the worms will be thrown up in a slimy mass, without any danger of any being driven further down. Whatever remedy is adopted, it is essential that all the worms should be burnt, as well as all chicks that may die of the disease, as even if the worms themselves are killed, their eggs may not be, and will go on propagating the evil.

Next to gapes, lice are perhaps the most to be dreaded of the foes of the young chick; and to keep these pests in check requires constant vigilance. Prevention is emphatically the remedy here. The coops should be whitewashed, inside and out, and all parts of the buildings, nest-boxes, etc., used by the fowls should be thoroughly whitewashed, or washed with water in which tobacco stems have been steeped, with petroleum, or dilute carbolic acid, and the oftener this is done the better. If, in spite of precautions, the lice make their appearance, then grease the hen on the back and under the wings with a mixture of lard and kerosene, using only enough of the latter to make the grease run easily, and being careful to keep it out of the eyes; or, what is better, apply pyrethrum, or Persian insect powder, for sale at all drug stores, and which, when fresh and pure, is a certain remedy for these pests. It is applied by blowing it up under the feathers by means of a small bellows which should accompany each package. Unless the lice are very bad it will not be necessary to grease chicks which the hen is brooding, as they will get enough from her.

Rats sometimes give great trouble in the poultry-yard, carrying off chickens of two and three months of age in large numbers. When they go at this they generally have a hiding place under some pile of rubbish to which they drag the chickens to eat them. If this place can be found, and the partly eaten chickens dusted with strychnine, it may abate the evil, but the surest riddance will be to organize a rat hunt and clean out the whole premises.

Hawks are sometimes very troublesome, and very difficult to manage. In such cases the following device, communicated to *Farm and Fireside* by a correspondent from Talbot county, Georgia, would certainly be worth a trial: "Place a live chicken in a large rat-trap, bird-cage, or lattice-box, fasten a steel trap to the top of the box or cage, and elevate them upon a pole or high stump where the chicken can be distinctly seen by the hawk. If properly arranged, you may expect to find his hawkship caught in the snare."



PARTRIDGE COCHINS.

CHAPTER III.

FALL AND WINTER MANAGEMENT.

We have followed the fowl from the egg to the half-grown chicken, or from March to the first of August. It now remains for us to trace the growth of the young chicken through the remainder of the year, in doing which it will be more convenient to include the general management of the whole poultry-yard, since from this date both young and old fowls may be allowed to run together, except where their separation may be made necessary for breeding purposes. Heretofore it has been assumed that the laying and breeding fowls, aside from those actually engaged in the rearing of broods, have had but little care, but have been expected to find their living on the range. If the range be large enough, this will be found not only the most economical plan, but that most conducive to the health of the fowls, as the exercise gained in hunting for food, and the variety of insect and green food thus obtained, will cause a thriftier growth than can be obtained by any artificial feeding.

Should the range be limited, however, and feeding on that account be rendered necessary, regard should be had to the natural habits of the fowl, by giving in the food a due proportion of meat and of green vegetables. For the meat supply butchers' offal is the best; soap-house scraps may be used in small quantity, if fresh. For the grain food, wheat screenings or barley are the best for the chief supply. Corn should be given in moderate quantities only, on account of its tendency to fatten. Sorghum seed is an excellent food for poultry; milk may be given liberally, and skim-milk, sweet or sour, mixed with wheat bran, makes an excellent food. Green vegetables of all sorts, especially cabbages and onions, should be given regularly. Should there be signs of too great looseness of the bowels, diminish the allowance of green and soft food, and increase that of grain. Pure water should, of course, be always in reach, and it is well to keep it in iron vessels, or to add occasionally a small lump of copperas (sulphate of iron), as a tonic, and preventive of roup and cholera. A dust bath of dry earth, sifted ashes, or both, should be always within reach, and the perches and inside of the hen-house should be kept sweet by whitewashing, and by cleaning the manure from the floors. Lime, in some form, should be constantly within reach, and the best form is that of oyster-shells pounded fine, or of ground bone. The latter may be mixed with the food to advantage, in the proportion of a tablespoonful two or three times a week to each dozen fowls. Without some such supply as this the egg-shells are liable to become soft. This mode of feeding may be continued to the commencement of winter, modifying the amount of food given to suit the conditions of range and season, as a protracted drouth may so shorten the natural food supply that fowls which have been maintaining themselves on the range may now require to be fed.

With the approach of winter we must prepare for furnishing a larger proportion of the food supply of our fowls, and as a large proportion of the winter food

of animals—from five eighths to the whole—is consumed in the maintenance of the animal heat, it is evident that whatever arrangements we may make for preventing the radiation of the heat of our fowls into the surrounding atmosphere, so far as these arrangements are compatible with health, will effect a positive

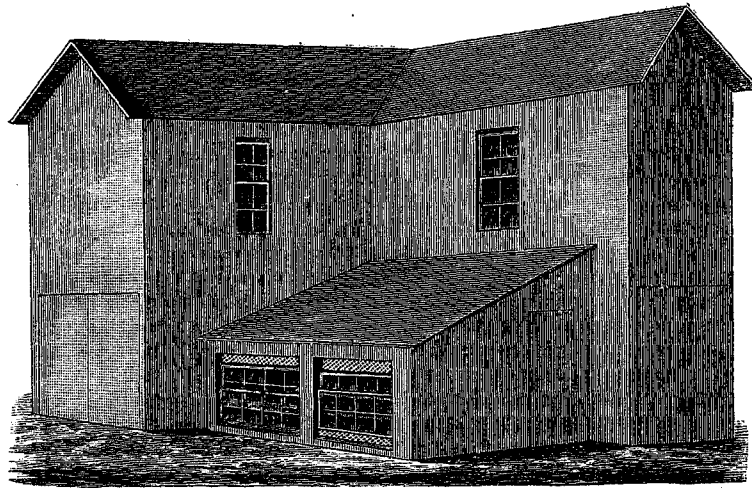


FIG. 15.—*Lean-to Poultry House.*

saving in the quantity of food consumed, saying nothing of the comfort we ourselves will take in the thought that the dumb animals dependent upon us are not being mercilessly exposed to the cutting blasts of the wintry nights.

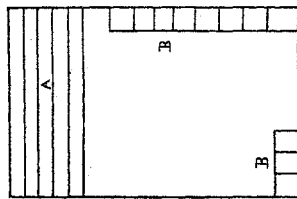


FIG. 16.

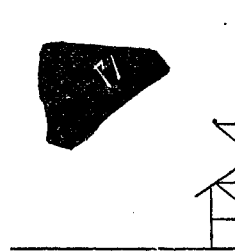


FIG. 17.

The essential points of a fowl-house are; exclusion of all currents of air, ventilation, light and cleanliness. It should be situated on the south side of other buildings, if possible, and should have, at any rate, a southern exposure, with a liberal supply of glass in its southern walls. Attached to it should be a yard where the fowls may exercise in pleasant weather, and if this yard contain the

manure heap from the horse-stable, so much the better. A small, low shed, built on the south side of a tight board fence, where the fowls may sun themselves and receive their food on pleasant days, will be thoroughly appreciated.

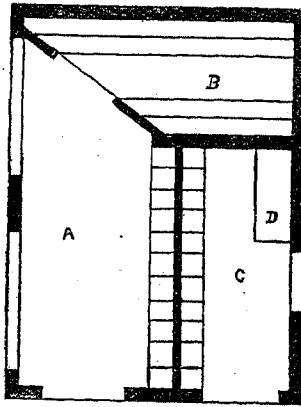


FIG. 18.—Family Poultry House, Ground Plan.

In Fig. 15, a small lean-to is shown, situated in the angle of a barn. The ground plan is shown in Fig. 16, in which the roosting poles are shown at A, and the nest-boxes at B B. The nest-boxes may be situated under a slanting board, as

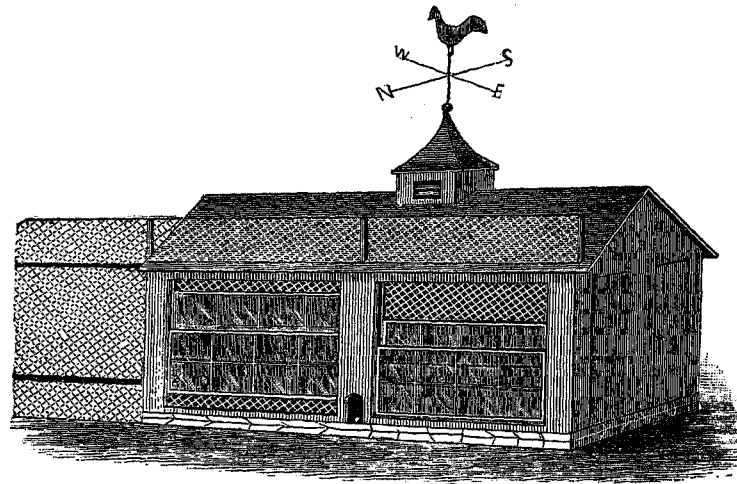


FIG. 19.—Family Poultry House.

shown in Fig. 17, with a roosting-pole fastened to brackets above it, provided so much roosting space be needed.

The roosting-poles should not be more than a foot from the ground, if the heavy Asiatic fowls are kept, as in flying down from higher roosts they are apt to injure their feet, producing the deformity called "bumble foot." All the poles should be at the same height to prevent the struggle for the highest perch, which is apt to ensue if they are at different heights. For the larger fowls especially, the poles should be at least three inches in diameter.

The nest-boxes may be made stationary, but a better plan is to make them after the plan shown in Fig. 1, so that they can be moved from place to place if desirable. In this case they should all be of the same size, to facilitate the changing of one with another.

In Fig. 18 is given the ground plan, and in Fig. 19 the elevation, of a family poultry house, intended to stand unconnected with other buildings, and to ac-

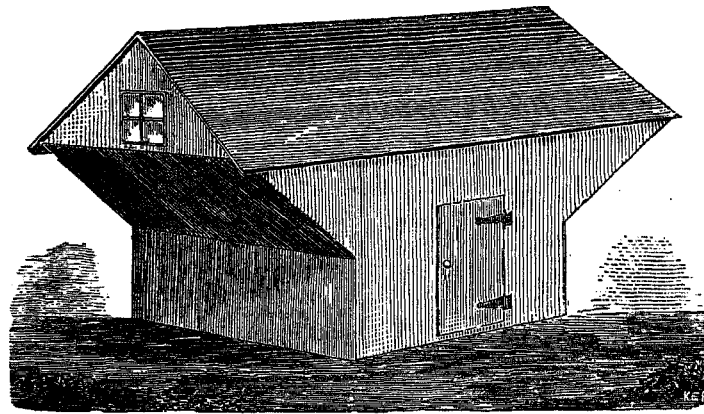


FIG. 20.—Self-Cleaning Poultry House.

commodate fifty fowls. For this number it should be about twelve by eighteen feet in size. *A* represents the laying room; *B* the roosting room; *C* the sitting room, and *D* a bin for grain. The nest boxes are shown in the partition between the laying and sitting rooms, and are intended to slide back and forth; but a better plan might be to make them portable, and connect those of the sitting-room with covered runs on the outside of the house, as shown in Fig. 4, removing the bin *D* to the opposite side of the room.

In Figs. 20 and 21 a self cleaning poultry house is shown; the roosts being in the gables, over the inclined floors, which are made of one by three inch slats, set on edge, and about an inch apart, so that the droppings will fall through.

Where several breeds of fowls are kept, the house represented in Figs. 18 and 19 may be extended to any length, and divided into sections of three rooms each, constructed on the plan shown, and opening into runways both in front and rear. A continuous passage way may be provided by changing the partition between the laying and roosting rooms.

The windows of the poultry-house should be hung on weights, or made to slide

horizontally, and should have wire netting on the inside, for the double purpose of protecting the glass, and of confining the fowls, if desired, when the windows are open.

The form of the poultry-house is but a secondary matter, the essential points

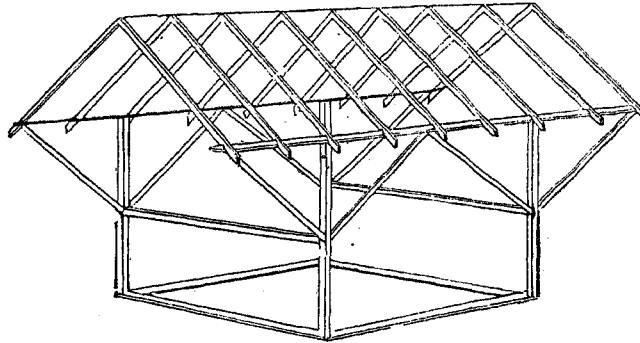


FIG. 21.—*Skeleton of Self-Cleaning Poultry House.*

being those previously enumerated, and these may be combined as well in a cave dug in the south side of a hill, as in the most expensive poultry-house, provided good judgment be exercised. In fact, such a house as that shown in Fig. 22 would present some decided advantages to those who particularly desire winter



FIG. 22.—*Hillside Poultry House.*

eggs, as the shelter and warmth provided by a building so situated would be of great assistance in egg production.

It is difficult to say which is the most important of the requisites for a poultry house which we have enumerated; but probably ventilation should come first, as if that is neglected, roup and other diseases are absolutely sure to follow. Next

to ventilation we should place warmth, to be secured by building in sheltered positions, and so arranging the building as to cut off all draughts of air. If it be necessary to build in an exposed situation the walls should be made double. Light may not be neglected, as the fowls will neither thrive nor even stay in a dark house, while cleanliness certainly may not be put at the end of the list, as filth is a certain breeder of disease.

After the providing of shelter the next point in the winter care of our fowls is to provide them with an abundant supply of suitable food. Fowls may be wintered, as some farmers do their other stock, in such a way that they will not only give no return for the little food they may chance to get, but will lose the flesh they have accumulated in the summer and fall, thus reaching the spring in such a condition that they must spend months in re-accumulating their necessary working capital of flesh and fat before they can begin the production of eggs. Such management is even more wasteful than the other extreme of over-feeding, and thus inducing laziness, which prevents the fowls taking the exercise in getting their food which is necessary to health. The proper mean between these two is the most readily attained where the fowls are kept in flocks of such size that they can find most of their living among the wastes of the manure pile and barn-yard, these being supplemented by the scraps from the household table, a regu-

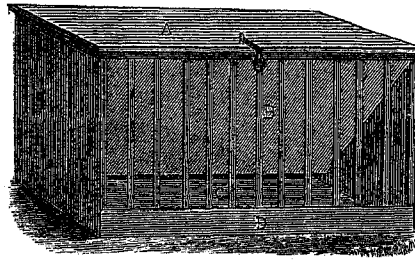


FIG. 23.—Feeding Box.

lar allowance of green food in some form, such as the trimmings of cabbages, small potatoes boiled and mixed with meal, and beets and turnips served in the same way. Unless they get a considerable allowance of meat in the table-scraps this should also be provided.

In general, where the fowls are fed regularly, it is as well to throw the food on the ground and let them scratch for it, the exercise thus gained being beneficial. When it is not desirable to feed in this manner, from inability to attend to them regularly, or from other reasons, a feeding-box like that shown in Fig. 23 may be used, in which a quantity of food may be placed, and the fowls allowed to help themselves at will. After once becoming satisfied, they will do this without danger to themselves, and will consume no more food in this way than when fed by hand all they will eat.

The box is so arranged that the grain falls from the main hopper *B*, into the trough *C* through the small aperture shown. As fast as it is removed from the trough more falls through, while the slats prevent the chickens from wasting or soiling the food.

CHAPTER IV.

LARGE SCALE POULTRY MANAGEMENT.

The handsome profits which have frequently been published as having been realized from the management of a few fowls, have led to occasional attempts to carry the business into a wider field; according to the common method of reasoning that if such a profit can be realized from so many fowls, a corresponding one should be obtained upon a larger number. Such attempts, however, have generally resulted in failure, even more generally, perhaps, than is commonly supposed, since the starting up of a new industry, when everything connected with it is novel, and while only the gilded estimates of its anticipated profits are to be seen, is likely to excite a very much wider attention than its quiet abandonment, after the unforeseen expenses and losses attending its management have brought disappointment and failure.

Moreover, some of the most highly gilded descriptions of large poultry farms and their management, have proved, on closer inspection, to have been manufactured out of the imagination of certain industrious hoaxers. Thus Lewis Wright, in his *Practical Poultry Keeper*, devotes twenty pages, illustrated with numerous engravings, to the description of a wholesale poultry establishment in France, this description being a "translation from an interesting work published under the authority of the French Minister of Agriculture," and telling of a certain Baroness de Linas, a widow, who, "partly for amusement, and partly in order to augment a rather scant income, turns her attention to poultry, and has for some time succeeded in both objects." This establishment, "situated at Charny, a village near Paris," was said to accommodate twelve hundred laying hens, with their broods; and Mr. Wright's description of it is said to have induced persons to cross the Atlantic for the purpose of visiting it, only to find that no such place as Charny was known in the neighborhood of Paris, and that the great poultry establishment of Madame de Linas existed only in imagination.

A similar hoax was the story of the mammoth poultry establishment of M. de Sora, also near Paris, in which twenty-two superannuated and damaged horses were daily slaughtered and cut up into mincemeat, for the benefit of a hundred thousand hens, that, under this regimen, laid three hundred eggs each per annum. This story was widely copied, even journals of such information and respectability as the *Mark Lane Express* being duped by it; but when the attempt was made to find M. de Sora's establishment it vanished into thin air.

Similar stories have had their origin on this side of the ocean, having not only poultry, but other industries for their object; now it may be a poultry farm in the east; to-morrow a frog farm in Wisconsin; next week a turtle farm in Alabama, etc., etc.

Among the *bona fide* attempts to carry on poultry management in this country on a large scale one of the most widely noticed has been that of Warren Leland, proprietor of the Metropolitan Hotel, New York City. Mr. Leland, having in his hotel a constant market at the best prices for all the surplus products of his poultry-yard, and also as constant a source of cheap and suitable food, maintained for a number of years a flock of hens reaching into the thousands in number. These, however, were not kept in close confinement, but had a free range of at least an acre for every hundred fowls, over a piece of rocky, brush-covered land, not fit for cultivation.

In 1877 Mr. W. C. Baker, of Cresskill, N. J., started an establishment in which it was proposed to hatch by artificial incubation and fatten by the French "cramming" process from a quarter to half a million chickens annually. Seventy-five thousand dollars were invested in buildings and apparatus, and the *Poultry World* published, in May of that year, a glowing account of the establishment and its prospects. By December, 1881, however, this establishment had changed hands no less than three times, having soon been abandoned by its originator.

In the number of the *Poultry World* for January, 1880, an account is given of another large establishment, managed after a similar plan to the above, being known as the "Crystal Spring" farm, and located at Medfield, Mass., in which five thousand fowls were kept, the product being taken by the Parker House, of Boston, at high prices.

In May, 1881, the same journal described an establishment belonging to A. C. Hawkins, of Lancaster, Mass., in which several thousand fowls were kept, being managed after the old-fashioned plan of natural incubation and feeding. In this establishment more space is given to the fowls than in any of the others described, the hens having the range of a pasture field of several acres, in addition to that afforded by the yards.

These, and other similar establishments that have been started within the past two or three years have not yet had time to demonstrate the practicability of wholesale poultry management. Disease is the great bane of such a business, and it is liable to break out at any time, as it has done in others which we have not named, causing the loss of thousands of dollars. Further than this, it has been demonstrated that hens will not generally yield so many eggs in confinement as when at liberty, while, as before said, their food will cost more.

With regard to the yield of eggs which may be expected from hens kept in large flocks, Mr. T. B. Miner, of Linden, N. J., a retired editor, and an experienced poultryman, estimates that one hundred eggs per annum will be as many as can be reasonably expected from each hen.* Mr. J. W. Brooks, proprietor of "Wayside Farm," near Milton, Mass., realized 112 eggs each from 800 hens kept in 1879.† Mr. A. C. Hawkins, before referred to, gives the average product of his 2000 hens "about ten dozen eggs each."‡

With regard to the cost of keeping the fowls Mr. Miner estimates, from actual experiment, that each fowl will require from a bushel and a quarter to a bushel and a half of grain per annum, with at least one hundred dollars worth of ani-

**Poultry World*, Vol. 3, p. 187. † Loc. Cit., Vol. 9, p. 269. ‡ Loc. Cit., Vol. 10, p. 146.

mal food in some shape per thousand fowls, which estimates are sustained by the statements of other large poultry farmers. From our personal experience we should say that the yield of eggs was put at the maximum, and the cost of keeping at the minimum. Upon these data each of our readers may estimate for himself the probable profits of poultry farming, according to the relative prices of feed, eggs and fowls in his locality.

H. H. Stoddard, editor of the *Poultry World*, has written a series of articles on this subject for the *American Agriculturist*, which have been republished by that journal under the title of *An Egg Farm*, the object of which is to suggest a modification of the ordinary methods of farm or village management for large scale poultry keeping. Mr. Stoddard reasons that the same methods which enable the inhabitants of a village to keep flocks of fowls amounting in the aggregate to many hundreds, might be successfully applied by a single individual, and he gives plans and estimates for the management of such a farm, in which the fowls shall be divided into flocks of not more than fifty, each flock being furnished with a separate building, and these being located ten or more rods apart.

The buildings are constructed in the cheapest possible manner; fences are dispensed with; and the food and water are carried from house to house on a low wagon, so that the capital invested and the cost of attendance are reduced to the lowest possible point. In order to successfully dispense with fences, the disposition shown by the fowls, on any farm where many are kept, to divide themselves into smaller flocks or families, each having its particular range, is cultivated by raising them at their separate homes, and by feeding them in such a manner that they shall not learn to expect food when they see their master, and thus to follow him from place to place.

Upon this system Mr. Stoddard estimates that five men can take care of 6000 fowls. Mr. Hawkins, above referred to, found himself able to care for 175 to 200 hatching hens and their broods, and 1200 laying hens, without any help. This was accomplished by having his buildings arranged with the utmost convenience. In ordinary management 600 to 1000 fowls would be found sufficient care for one person.

With regard to the capital required for this business, the lowest estimate that can be made for housing the fowls will be fifty cents each, which would represent a space for each fifty fowls of twelve by sixteen feet in size by four feet high at the back and seven at the front, both sides and roof being made of common barn-boards, and the whole costing, with a window in front, nails, door-hinges, etc., not less than \$25.00. If fenced runs are necessary these would cost from \$10.00 for each fifty fowls, upward. Extra coops, feeding vessels, etc., would add \$2.50 for each fifty fowls, making the minimum cost for buildings, fences, etc., from 75 cents to \$1.25 for each fowl, according to prices of material and labor.

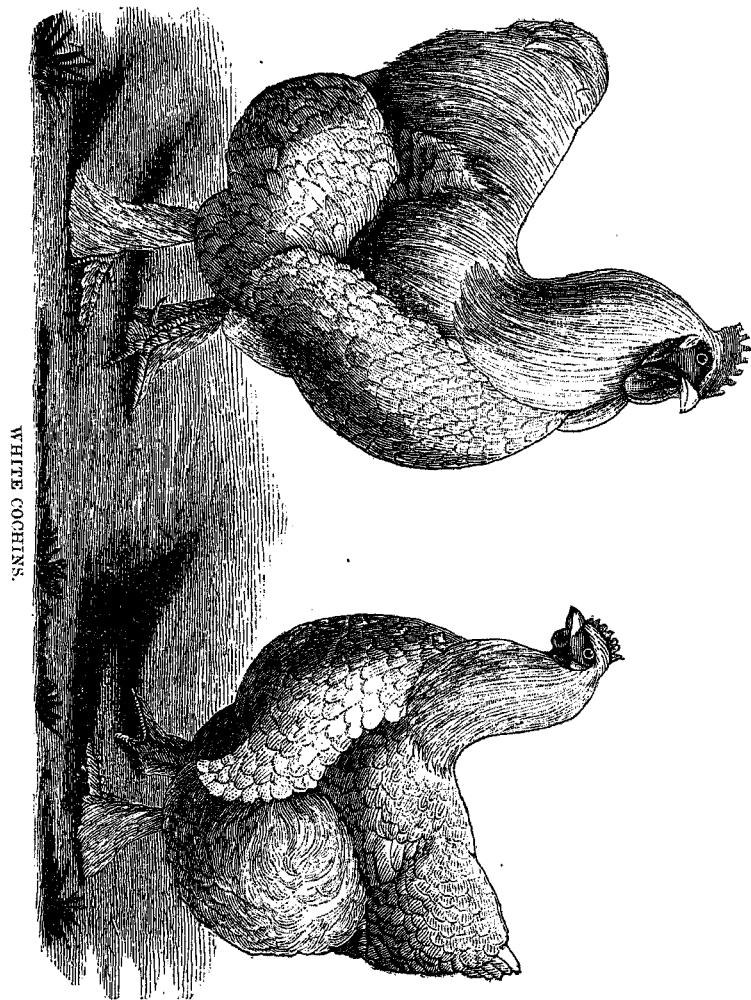
CHAPTER V.

ARTIFICIAL INCUBATION.

The Chinese and Egyptians have, for thousands of years, had the secret of hatching eggs without the intervention of the hen. Indeed, it would seem almost a matter of course that the inhabitants of tropical countries should early have learned this art, from watching the method by which the eggs of turtles, alligators, etc., are incubated, being simply buried in the warm sand of the river's bank. As early as 1750 the French scientist, De Reaumur, perfected a process of artificial incubation, which, though successful, was not practicable for ordinary purposes. During the past twenty years, however, the attention of poulterers has been freshly drawn to this question, and now the number of appliances for artificial incubation bids fair to equal the patent bee-hives.

The essentials of a successful incubator are three: an equable heat of about 105 degrees; sufficient moisture in the atmosphere to prevent an undue evaporation from the egg; and ventilation. These conditions are obtained by the Egyptians and Chinese through the use of large ovens, which are watched day and night by skilled attendants. De Reaumur, in his investigations upon this subject, first used ovens, but unsuccessfully; his final success was obtained by the use of fermenting horse manure, and that material is still employed in at least one of the processes used to-day. It is not a pleasant material to handle, however, and does not give that opportunity for frequent inspection of the eggs which is desirable, hence numerous attempts have been made to revive the more ancient processes, with such modifications as are demanded by our age of steam and lightning, and especially to provide an automaton which shall raise the flame of the lamp when the mercury in the egg-drawer begins to fall, and lower it if the heat becomes too great. This is the problem which has vexed the soul of many a Yankee during the past two decades.

It has been found that the mercury may rise to 110 degrees without injury to the eggs, provided it does not remain at that point more than a very few minutes, or it may sink as low as 50 degrees, for a correspondingly short time; but should it remain below 100, or above 106 for many hours, all the labor expended upon the lot of eggs which the incubator may then contain will have been thrown away, while, as will be seen, it requires a very delicate instrument to quickly appreciate the difference between these degrees of heat. Electricity, that most subtle of all the powers of nature whose aid man has learned to invoke, has been naturally the first thought of many for this work, and numerous machines have been constructed with electrical appliances attached, so arranged in connection with instruments for the measuring of heat that a very slight change in the temperature of the drawer containing the eggs will cause machinery to be



WHITE COCHINS.

set in motion which will alter the height of the flame to correspond with the needs of the eggs.

The practical difficulty about these machines is the extreme delicacy of their construction, rendering them liable to get out of order in inexperienced hands, and thus to cause a great loss of eggs. Of course the manufacturers of each machine claim that their's is absolutely perfect, and that these objections pertain to all the others; but the testimony of disinterested parties who have given a large number of the best machines a thorough trial, is that not one of them is always reliable, and that all are sure to give trouble to beginners in their management, although one who has had experience in handling them may hatch a larger proportion of eggs than is usually done by the average hen.

In Figs. 24 to 27 we illustrate the essential principles of an artificial incubator, except the apparatus for regulating the heat. Such an incubator may be used successfully if placed in a room which can be maintained at a nearly uniform temperature by means of an airtight stove. This description is taken from the "Youth's Companion," and the incubator is not patented.

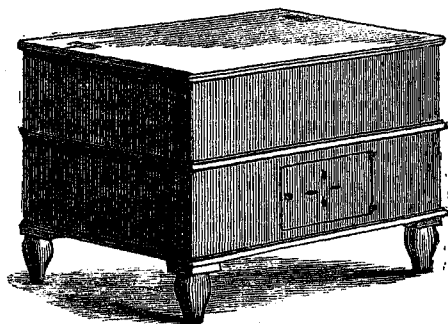


FIG. 24.—Incubator Closed.

"Have a pine case made somewhat like a common wash-stand (See Fig. 24) without the inside divisions.

About a foot from the floor of this case, place brackets like those in Fig. 25, and on a level with these screw a strong cleat across the back of the case inside. These are to support the tank. The tank should be made of galvanized iron, three inches deep and otherwise proportioned to fit exactly within the case and rest upon the brackets and cleat. The tank should have a top or cover soldered on when it is made. At the top of this tank in the centre should be a hole an inch in diameter with a rim two inches high, and at the bottom, towards one end, a faucet for drawing off the water. When the tank is set in the case, fill up all the chinks and cracks between the edges of the tank and the case with plaster of Paris to keep all fumes of the lamp from the eggs. Fill the tank at least two inches deep with boiling water. To find when the right depth is acquired, gauge the water with a small stick. Over the top of the tank spread fine gravel a quarter of an inch thick; over this lay a coarse cotton cloth. Place the eggs on the cloth, and set a kerosene safety-lamp under the centre of the tank. The door of

the lamp-closet must have four holes for ventilation, otherwise the lamp will not burn. The lamp-closet is the space within the incubator under the tank. Turn the eggs carefully every morning and evening, and after turning sprinkle them with quite warm water. Two thermometers should be kept in the incubator, one half-way between the centre and each end; the average heat should be one hundred and five degrees. If the eggs do not warm up well, lay a piece of coarse carpet over them. If they are too warm, take out the lamp and open the cover

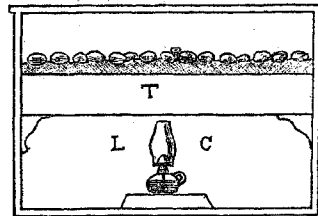


FIG. 25.—*Inside of Incubator. Front Section—T, Tank; L C, Lamp Closet.*

for a few minutes, but do not let the eggs get chilled. If they should happen to get down to ninety-eight or up to one hundred and eight degrees, you need not think the eggs are spoiled. They will stand such a variation once in a while; but, of course, a uniform temperature of one hundred and five degrees will secure more chickens, and they will be stronger and more lively. In just such an incubator as this one I have described, I hatched over two hundred chickens two years ago.

For those who are ambitious to try top-heat, the same sort of a tank is required, but a boiler must be attached at the side with an upper and lower pipe

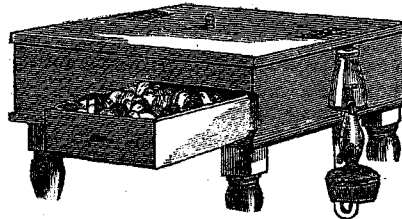


FIG. 26.—*Top-heat Incubator, on Table.*

for circulation. Any plumber can attach the boiler, and the faucet must be at the bottom of the boiler on one side. The drawers containing the eggs should slide beneath this tank. A stand for the lamp should be screwed to one end of the case in such a position as to bring the lamp under the boiler. (See picture.) This incubator can be cooled by raising the lid, turning down the lamp and pulling the drawers part way out. In both incubators while the eggs are hatching sprinkle them two or three times with quite warm water."

With such an apparatus as this, the principles of incubation may be thoroughly learned, and probably the combination of such an apparatus with the use of a room heated by a furnace or a good stove, or of a cellar of even temperature, will give quite as satisfactory results as may be obtained from the high priced and complicated patent incubators.

Another form of incubator is said to be used in France, and that is, live turkeys. The following account of this process is given by Mr. Geyelin, formerly manager of the National Poultry Establishment, at Bromley, Kent, England, who was, at the time he discovered it, traveling in France in search of the mythical establishment of M. de Sora, previously referred to. The account savors to us very much of fish, but as it is seriously quoted by Tegetmeier, we give it for what it is worth:

"Amongst some places I visited may be mentioned the farm of Madame La Marquise de la Briffe, Chateau de Neuville, Gambais, near Houdan, where we observed twelve turkeys hatching at the same time; in another place, that of M. Anche, of Gambais, a hatcher by trade, we observed some sixty turkeys hatching at the same time; and we were informed that during winter and early spring he had sometimes upwards of one hundred hatching at the same time, and that each turkey continued hatching for at least three months. At the farm of M. Louis Mary, at St. Julien de Fancon, near Lizieux, in Calvados, I saw a turkey

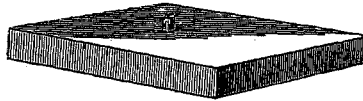


FIG. 27.—Form of Tank.

that was then sitting that had been so upwards of six months, and, considering it rather cruel, the hatcher, to prove the contrary, took her off the nest and put her in the meadow, and also removed the eggs; the turkey however, to my surprise, returned immediately to her nest, and called in a most plaintive voice for her eggs. Then some eggs were placed in the corner of a box, which she instantly drew under her with her beak, and seemed quite delighted. Moreover, I was informed that it was of great economical advantage to employ turkeys to hatch, as they eat very little and get very fat in their state of confinement, and therefore fit for the market any day.

"The hatching-room is kept dark, and at an even temperature in summer and winter. In this room a number of boxes, two feet long, one foot wide and one foot six inches deep, are ranged along the walls. These boxes are covered in with lattice or wire-work, and serve for turkeys to hatch any kind of eggs. Similar boxes, but of smaller dimensions, are prepared for broody fowls. The bed of the boxes is formed of heather, straw, hay or cocoa fibres; and the number of eggs for turkeys to hatch is two dozen, and one dozen for hens.

"At any time of the year turkeys, whether broody or not, are taught to hatch in the following manner: Some addled eggs are emptied, then filled with plaster of Paris, then placed in a nest; after which a turkey is fetched from the yard and placed on the eggs, and covered over with lattice. For the first forty-eight

hours she will endeavor to get out of her confinement, but soon becomes reconciled to it, when fresh eggs are substituted for those of plaster of Paris. The hens will continue to hatch, without intermission, from three to six months, and even longer; the chickens being withdrawn as soon as hatched, and fresh eggs substituted. After the third day the eggs are examined and the clear eggs withdrawn, which are then sold in the market for new laid; but as they may be soiled or discolored from having been sat upon, they clean them with water and silver-sand to restore their original whiteness. The turkeys are taken off their nests once a day to feed and to remove their excrements from the nests; but after a while they cease self-feeding, when it is necessary to cram them, and give them some water once a day.

"In some parts of France, where poultry-breeding is carried on as a trade, they seldom allow a hen to lead the chickens after being hatched, as the hen is more valuable for laying eggs; but they entrust this office either to capons or turkeys, who are said to be far better protectors to the chickens than hens. They require, however, a certain amount of schooling preparatory to being entrusted with their charge, which consists in this: when a turkey has been hatching for some months, and shows a disposition to leave off, a glassful of wine is given her in the evening, and a number of chickens are substituted for the eggs; on waking in the morning she takes kindly to them, and leads them about, strutting amidst a troop of seventy to one hundred chickens with the dignity of a drum-major. When, however, a troop leader is required that has not been hatching, such as a capon or a turkey, then it is usual to pluck some of their feathers from their breasts, and to give them a glass of wine, and whilst in a state of inebriation to place some chickens under them; on getting sober the next morning they feel that some sudden change has come over them, and as the denuded part is kept warm by the chickens they take also kindly to them. In conclusion I feel in justice bound to say that these artificial living protectors are most efficient to shelter chickens in the day time, and in the evening they are placed with their charge in a shallow box filled with hay, from which they do not move until the door of the room is opened next morning. I must not omit to mention that the chickens are not entrusted to the mother or a leader before they are a week old, and then only in fine weather."

This use of capons or turkeys as foster-mothers if practicable, would obviate one of the most serious difficulties of artificial incubation, which is the providing of a substitute for the maternal instinct of the hen-mother in the rearing of the young chicks, which has been found almost as serious a difficulty in their case as is that of the unfeathered biped. Indeed some do not attempt to meet this difficulty, but manage to have a lot of hens sitting on porcelain eggs at the time the wood-and-iron hen is at work, starting them at such a time that they shall have been on the nest a week or two before the chicks are hatched, and then giving them the chicks at the rate of eighteen to twenty to each hen.

Several forms of artificial mothers, however, have been invented—and most of them, of course, patented—of which the inventors claim that they far surpass the natural mothers, in that they do not drag their chicks through the dew, nor trample them to death, nor cover them with vermin; all of which, no doubt, are positive advantages, but in practice these advantages have been offset by

the lack of the instinctive care of the mother hen. The artificial mother may frequently be used to advantage, however, in supplementing that care.

The essential points of the artificial mother are a sheep-skin tanned with the wool on, or a piece of buffalo robe or similar material, fixed with the wool side down upon a frame which will hold it just high enough for the chicks to creep under, and which may be raised to suit their growth; and a system of pipes, or a water-tank similar to that used in the incubator, placed over the sheep-skin, and warmed as in the incubator. The "mother" should also be placed in a room warmed with a stove, for the more easy regulation of the heat.

While the incubator and artificial mother are certainly not what is claimed for them by some of the more sanguine of their advocates—especially those who have a pecuniary interest in selling them—there can still be no doubt that they may be made of great service in the poultry-yard, in the hands of persons who have the time and natural adaptitude necessary to give that close and judicious attention to the details of their management which is absolutely necessary to success.



CHAPTER VI.

FATTENING, CAPONIZING, AND MARKETING POULTRY.

By the time the chickens are four months old they will be large enough for the table, and in the condition of fatness which most persons will prefer. If, however, it be desired to market a portion of the surplus, they will sell to better advantage to be made still fatter, which may be done by confining them in pens such as those shown in Fig. 28, which represents a long coop, two feet high and two feet broad, and divided into compartments nine inches wide. These divisions should be tight, so that the fowls may not see each other, and should project a few inches beyond the front of the coop. The bottom of the coop should be made of triangular slats running lengthwise of the coop, with the angle upward, so that the droppings may fall through, and a shallow pan filled with dry

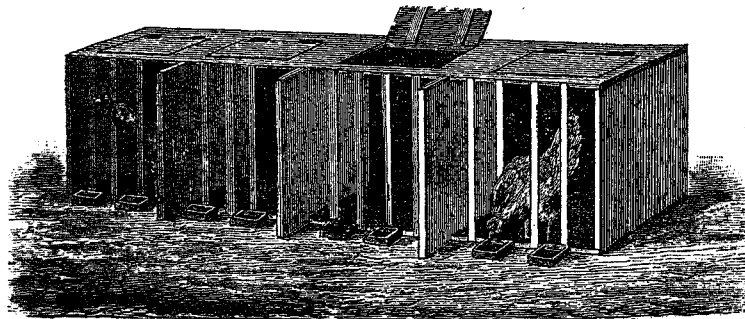


FIG. 28.

earth should be placed under each compartment to catch these droppings. A ledge four inches wide should project beyond the bottom of the coop, to hold the vessels of food and water, and a small curtain (not shown in the cut) should be tacked in front of each compartment, in such manner that the compartment may be darkened for a couple of hours after the fowl has fed, as the darkness and quiet will render digestion more perfect. The curtain should be lifted an hour or two before the next feeding time, however, that the chicken may come to his meal with an appetite.

A young fowl placed in one of these compartments and properly fed, may be made to lay on a couple of pounds of fat in two or three weeks. The best food for fattening is buckwheat meal, or corn meal and barley meal mixed, and if it be scalded and mixed with milk it will be all the better. Remember that water constitutes a large proportion of fat, and that it must be given either in the food or separately. Give no more soft food than will be eaten up clean each time, but a little whole grain may be kept constantly within reach, and a regular supply of it will be necessary to the thrift of the fowl. The feeding should be done

three or four times a day. As soon as the fowls are fat they should be marketed, as they will immediately begin to lose flesh if kept beyond the proper time.

In France this fattening process is carried through still another stage, by *cramming* the fowls. Cramming consists in forcing pellets of dough down the throats of the fowls, after they have been induced to eat as much as possible in the natural way. The following account of this unnatural, and, in our estimation, unprofitable process, is taken from Tegetmeier:

"The food used for fattening fowls in France is chiefly buckwheat-meal bolted quite fine. This is kneaded up with sweet milk till it acquires the consistency of baker's dough; it is then cut up into rations about the size of two eggs, which are made up into rolls about the thickness of a woman's finger, but varying with the size of the fowls; these are subdivided by a sloping cut into "patons," or pellets, about two and a half inches long.

"A board is used for mixing the flour with the milk, which in winter should be luke-warm. It is poured into a hole made in the heap of flour, and mixed up little by little with a wooden spoon so long as it is taken up; the dough is then kneaded with the hands till it no longer adheres to them.

"Some say that oat-meal, or even barley-meal, is a good substitute for buckwheat-meal; but Mdlle. Millet Robinet (from whose work, 'Oiseaux de Basse Cour,' this account is quoted by Tegetmeier) is not of that opinion. Indian corn may do, but it makes a short, crumbly paste, unless mixed with buckwheat, when it answers well if cheap enough, but buckwheat is a hardy plant, which may be grown anywhere at small cost.

"The food is thus administered: The attendant puts on an apron which will stand being soiled or torn, and having the pellets at hand, with a bowl of clear water, she takes the first fowl from its cage gently and carefully, not by the wings nor by the legs, but with both hands; she then seats herself with the fowl upon her knees, putting its rump under her left arm, by which she supports it; the left hand then opens its mouth (a little practice makes this very easy), and the right hand takes up a pellet, dips it in the water (this is essential), shakes it on its way to the open mouth, puts it straight down, and carefully crams it with the fore-finger well into the gullet; when it is so far settled down that the fowl cannot eject it, she presses it down with thumb and fore-finger into the crop, taking care not to fracture the pallet.

"Other pellets follow the first till the feeding is finished in less time than one would imagine. It sometime happens in feeding that the tracheæ is pressed together with the gullet; this causes the fowl to cough, but it is not of any serious consequence, and with a little care is easily avoided. The fowl when fed is again held with both hands, and replaced in its cage without fluttering, and so on with each fowl.

"The chicken should have two meals in twenty-four hours, twelve hours apart, provided with the utmost punctuality; if it has to wait it becomes uneasy, if fed too soon it has an indigestion, and in either case loses weight. On the first day of cramming only a few pellets are given at each meal; the allowance being gradually increased till it reaches twelve or fifteen pellets. The crop may be filled, but at each meal you must make sure that the last is duly digested, which is easily ascertained by gentle handling. If there be any food in it, digestion has

not gone on properly; the fowl must miss a meal, and have rather a smaller allowance next time. If too much food be forced upon the animal at first it will get out of health, and have to be set at liberty.

"The fattening process ought to be complete in two or three weeks, but for extra fat poultry twenty-five or twenty-six days are required; with good management you may go on for thirty days; after this the creature becomes choked with accumulated fat, wastes away and dies. A fowl usually takes more than a peck of buckwheat to fatten it. The fat of fowls so managed is of a dull white color; their flesh is as it were seen through a transparent, delicate skin."

In another French method of fattening, quoted by Tegetmeier from *Le Poularier*, a treatise by M. Jacque, the food is given in a liquid state by means of a funnel, the lower part of which is cut diagonally, and the edges of the tin turned back to prevent injuring the mouth of the fowl. The food given is barley-meal mixed with milk and water to the consistence of thin gruel.

In England still another process has been used, the food actually being forced down the poor fowl's unwilling gullet by a machine resembling a sausage-stuffer, having a long, syringe-shaped nozzle, made of India rubber, a man turning the wheel of the machine, while a boy places the fowls at the spout with such rapidity that three hundred birds could be crammed in an hour.

These operations may be profitable in England and France, and possibly to a very limited extent in preparing fowls for the tables of the gourmands of some of our largest cities, but before they can come into general use there must be a wider margin between the selling price of the fatted fowl and the cost of the food required to fatten it than there is at present. As a preparation for the fattening process the French consider *caponizing*, or castrating, a necessity. For ourselves we do not believe this any more profitable than the cramming process, but for the benefit of those who may wish to experiment with it we give the following directions for performing the operation:

The best birds for capons are the large breeds, Asiatics or Dorkings. They should be two or three months old. Before the operation they should be deprived of food for from twenty-four to forty-eight hours, so as not to have their bowels distended. The bird to be operated on must be fastened down on his left side to a board or bench through an auger-hole; the wings should be drawn together over his back and well secured; the legs drawn backward, the upper one drawn out furthest and secured. The feathers must be plucked from the right, or upper side, near the hip joint, on a line with and between the joints of the shoulder. The space uncovered should be about one and a half inches in diameter on an ordinary sized bird. Draw the skin of the part backward, so that when the operation is finished the skin slides back to the natural position and covers the wound in the flesh, and does *not*, when neatly done, require sewing. Make an incision with a fine, sharp penknife (a proper instrument is best) between the last rib and hip, commencing about an inch from the back-bone; extend it obliquely downward, from an inch to an inch and a half, just cutting deep enough to separate the flesh; take great care not to wound the intestines. The wound must be kept open with an instrument with a spring, called a retractor, or with something answering the same purpose, stretching it wide enough to afford room for the work. Then carefully cut the membrane covering the in-

testines, which, if not sufficiently drawn up, may be pushed toward the breast-bone lightly by a spoon-shaped instrument, or the handle of a teaspoon. The organs to be removed are readily recognized—a small, reddish-yellow cylinder attached to the spine on each side, covered with a fine membrane or skin, which must first be removed with forceps and a fine hook to draw it away. With the left hand introduce the bowl of a spoon (an instrument is made for the purpose) under the lower or left testicle, which is generally a little nearer to the rump than the right one. Then take the instrument called a cannula, which is a hollow tube with a horse-hair passed through it, forming at the end a loop which can be tightened by pulling on the two ends of the hair at the other end of the tube. Pass this loop around the testicle with the aid of something to place it in position—the cannula has a hook for this purpose—so as to bring the loop to act upon the parts which connect the organ to the back. Then by drawing the ends of the hair loop backward and forward, and at the same time pushing the lower end of the cannula toward the rump of the fowl, the cord or fastening of the organ is severed. A similar process is then to be repeated with the uppermost or right testicle, after which any remains of the organs, together with the blood around the wound or at the bottom, must be removed with the spoon. The reason for operating on the lower or left organ first is to prevent the blood from covering the lower one if left last. When the operation is performed—which if skillfully done occupies but a few moments—the retractor is taken out and the skin drawn over the wound, which if it was drawn on one side before cutting (as mentioned above) will connect at a place not exactly opposite the wound in the flesh, thereby covering the flesh wound. If skillfully done it requires no sewing. The old French system was to operate on each side of the fowl, but the system here described is considered an improvement on the antiquated Gallie method.

A corresponding operation may be performed upon pullets, making what the French term “poulardes.” We again quote from Tegetmeier:

“The pullet is placed in the lap of the operator, on its right side and with its back turned to the operator, the left leg being drawn forward so as to expose the left flank, in which a longitudinal incision is made close to the side bone; this will bring to view the lower bowel, and alongside of it will be found the egg passage or egg-pipe. If this is drawn to the orifice of the wound by a small hooked wire, and cut across—or, what is perhaps better, a very short piece of it removed—the developement of the ovary or egg-producing organ is entirely prevented, and the birds fatten rapidly, attaining also to a very large size. It is most important to perform the operation before the pullets have begun to lay. We would beg to impress most strongly the desirability of practicing these operations in the first instance on dead birds of the same age, so that the operator may become acquainted with the situation and appearance of the parts concerned. By this means a greater amount of success will be attained in the first instance, and much unnecessary suffering saved to the animals.

“The operation of making capons and poulardes is, as we have shown, attended with some risk. The advantages gained are slight in comparison with the danger of losing the bird, and with the positive amount of unnecessary pain inflicted upon the animal.”

DRESSING AND PACKING POULTRY FOR MARKET.

A correspondent of *Farm and Fireside* furnishes the following directions for preparing poultry for market:

"As much, if not more, depends upon the manner of killing poultry as on that of dressing it to have it fit for the market. Too much caution cannot be used in this branch of the business.

"The French mode of killing we think far the best, as it causes instant death



FIG. 29.

without pain or disfigurement, and is simply done by opening the beak of the fowl, and with a sharp-pointed and narrow-bladed knife, making an incision at the back of the roof of the mouth, which will divide the vertebræ and cause immediate death, after which the fowl should be hung up by the legs till bleeding ceases, and picked while warm. The flesh presents a better and more natural appearance than it does after the old-fashioned way of scalding. Fowls should

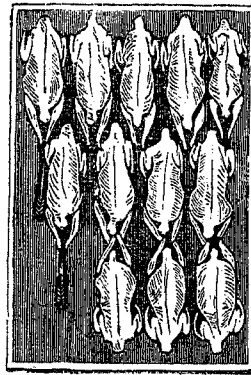
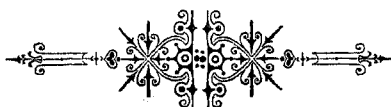


FIG. 30.—Packing for Market.

always be allowed to remain in their coops without food at least twenty-four hours previous to being killed, as the flesh will keep longer and present a better appearance in the market.

"All poultry should be thoroughly cooled before packing. Then provide boxes, for they are preferable to barrels, and place a layer of rye straw that has been thoroughly cleaned from dust on the bottom. Commence packing by bending

the head under the body (See Fig. 29); then lay the fowl in the left-hand corner, with the head against the end of the box, and the back up, and continue in the same manner until the row is filled. Then begin the second row in the same manner, letting the head of the bird pass up between the two adjoining birds, which will make the whole solid and firm. (See Figure 30.) In packing the last row reverse the order, placing the heads against the end of the box, and letting the feet pass under each other, and fill the spaces with straw. Over this layer place enough straw to prevent the next layer coming in contact with it, then add other layers, packed in the same manner, until the box is filled. Care should be taken to fill the box full, in order to prevent any disarrangement. To those having extra fine poultry to send to market, we would recommend wrapping each fowl in paper, before packing; this will prevent dust and straw adhering to it, and will add much to its appearance. The box should have the initials of the consignor, the number and variety of contents, as well as the name of the consignee, marked on it."



CHAPTER VII.

THE DISEASES OF POULTRY.

In addition to the parasites affecting the young chickens, older fowls are subject to a few diseases, of the principal of which we quote the following descriptions from Tegetmeier, with the remedies proposed by him, premising, however, that for most seriously marked cases of disease in common fowls, the axe and chopping-block are the safest and most economical remedy, as the care and attention necessary to restore a thoroughly diseased fowl to health will generally far outweigh its value, while the danger of propagating the disease among healthy fowls is a consideration which should be constantly kept in mind.

Whenever there is any suspicion that a fowl has been affected with roup or cholera, which are contagious, and the most troublesome of poultry diseases, the fowl, unless very valuable, should be killed and burnt, as the disease is liable to be propagated from its carcass when simply buried, through the burrowing of earth worms, and their carrying of the disease germs to the surface.

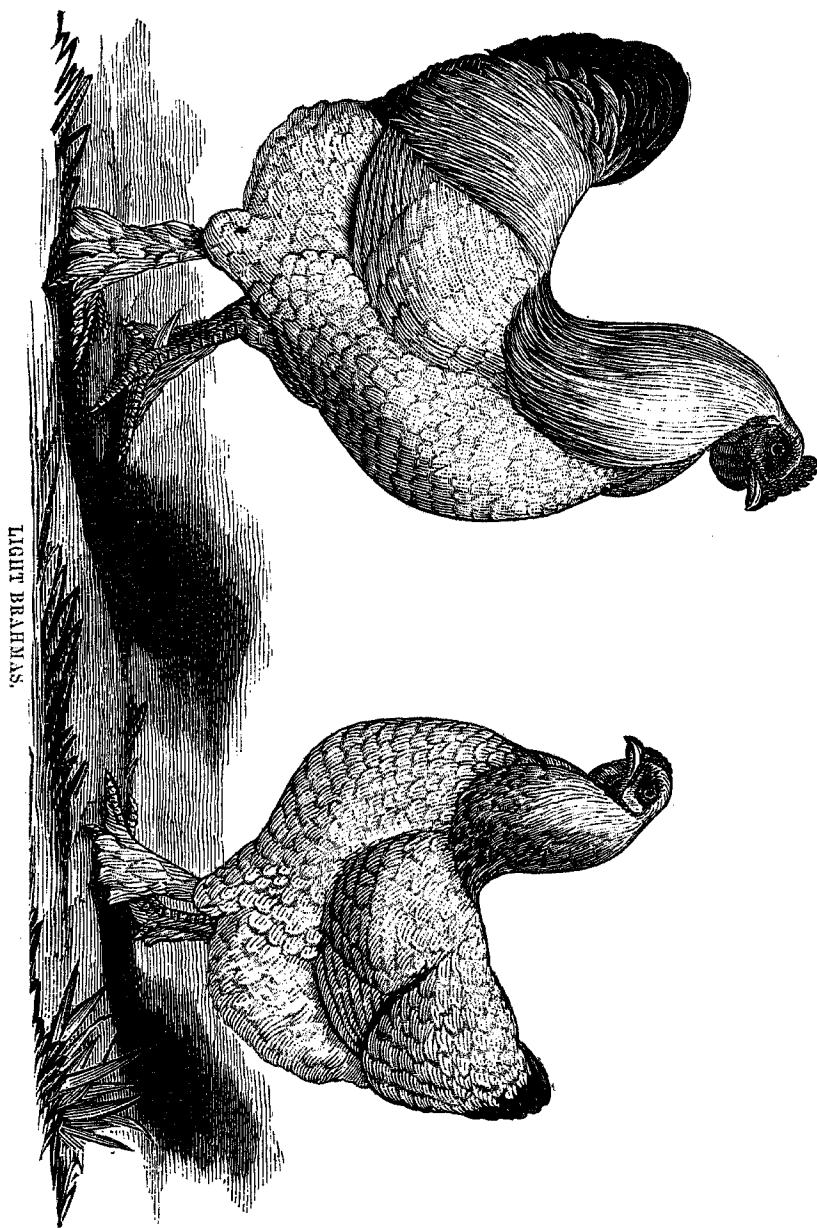
DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

APOPLEXY.

Symptoms.—The symptoms of apoplexy are plain and decisive—a fowl apparently in the most robust health, falls down suddenly, and is found either dead or without sensation and the power of motion. These symptoms are occasioned by the rupture of a vessel in the skull, and the consequent effusion of blood, which by its pressure on the brain, produces the evil.

Causes.—Apoplexy is almost invariably caused by a full habit of body; it is therefore frequent in over-fed birds, and is most common among laying hens—which are sometimes found dead on the nest—the expulsive efforts required in laying being the immediate cause of the attack. Unnatural and over-stimulating food, as greaves, hemp, and a large proportion of pea or bean meal, greatly predisposes to the disease.

Treatment.—In this disease much may be done in the way of prevention—little towards cure in an actual attack; the only hope consists in an instant and copious bleeding by opening a vein with a sharp-pointed pen-knife or a lancet. The largest of the veins seen on the underside of the wing should be selected, and opened in a longitudinal direction, not cut across; and so long as the thumb is pressed on the vein, at any point between the opening and the body, the blood will be found to flow freely. If the bird recovers it should be kept quiet, and fed on light food for some time after the operation.



LIGHT BRAHMAS.

VERTIGO.

Symptoms.—Fowls affected with this disease may be observed to run around in a circle, or to flutter about with but partial control over their muscular actions.

Causes.—The affection is one evidently caused by an undue determination of blood to the head, and is dependent on a full-blooded state of the system, usually the result of over-feeding.

Treatment.—Holding the head under a stream of cold water for a short time immediately arrests the disease, and a strong dose of any aperient, such as three grains of calomel and ten grains of jalap, or jalap alone, removes the tendency to the complaint. The bird should be kept on a low diet for some time after the attack.

PARALYSIS.

Symptoms.—An inability to move some of the limbs. In fowls, the legs usually are affected, and are totally destitute of the power of motion. Care must be taken not to confound this disease with leg-weakness, which will be described under the head of Diseases of the Limbs, and which requires a totally different mode of treatment.

Causes.—Paralysis usually depends on some affection of the spinal cord, and is another result of over-stimulating diet.

Treatment.—Nothing can be done by way of cure; the cases may be regarded as hopeless, or nearly so.

DISEASES OF THE DIGESTIVE ORGANS.

CROP-BOUND.

Symptoms.—The crop, or membranous dilation of the gullet, whose office it is to receive the food as it is swallowed, and transmit it in small portions at a time to the gizzard, is sometimes so overcharged that it is unable to expel its contents into that organ. From the emptiness of the gizzard the bird feels hungry, and by continuing to eat adds to the mischief, until at last, by the contraction of the crop and the swelling of the grain, a hardened mass is formed, weighing in some cases nearly a pound, and by the enormous protuberance it causes giving evident indications of its presence. Sometimes the disease is occasioned by a single object being swallowed, whose size is too large to permit it to pass into the stomach. In this case it serves as a nucleus for other matters, and a mass is formed around it.

Treatment.—The treatment of this disorder is very simple. With a sharp pen-knife an incision must be made through the skin and then into the upper part of the crop; the hardened mass loosened by some blunt-pointed instrument, and removed. If it has remained many days and is very offensive, the crop may then be washed out by pouring in some warm water. The incision, if small, may be left, but if large, a stitch or two is advisable. The bird should be fed on soft food for a day or two, and will rapidly recover. The administration of gin, as is recommended by some ignorant writers, is certain to cause the death of a crop-bound fowl.

DIARRHOEA.

Symptoms.—The symptoms of diarrhoea are so evident as to render description unnecessary.

Causes.—A too scanty supply of grain, which necessitates an excess of green food, or an unwholesome dietary of any description, are the usual causes of this complaint.

Treatment.—Give five grains of powdered chalk, the same quantity of rhubarb, and three of Cayenne pepper; if this does not speedily check the relaxation give a grain of opium and one of powdered ipecacuanha every four or six hours. Care should be taken not to confound a simple diarrhoea with cholera, which will be described further on.

CATARRH.

Symptoms.—The symptoms of a cold, or catarrh in fowls, are identical with those so familiar in the human subject—namely, a watery or adhesive discharge from the nostrils, and a slight swelling of the eyelids; in worse cases the face is swollen at the sides, and the disease appears to pass into true roup.

Causes.—The cause is exposure to cold or dampness; such as a long continuance of cold, wet weather, or sleeping in roosting places open to the north or east.

Treatment.—In simple cases, removal to a dry, warm situation, and a supply of food rather more nutritious and stimulating than usual, soon effect a cure. A little mashed potato, well dusted with common pepper, has been found very advantageous. In severe cases the disease so closely resembles roup that it may be treated in the same manner.

BRONCHITIS.

Symptoms.—If the cold, to use a popular mode of expression, settles on the lungs instead of affecting the head, the symptoms are somewhat different; there is rattling in the throat, from the accumulation of mucus, which the fowl coughs up and expectorates at intervals.

Treatment.—Removal to a drier habitation is sufficient in almost all cases to effect a cure. In severe cases one grain of calomel and one eighth of a grain of tartar emetic may be given at night.

ROUP.

Symptoms.—The symptoms of roup are at first identical with those of a severe catarrh; the discharge from the nostril, however, soon loses its transparent character, becoming more or less opaque, and of a very peculiar and offensive odor; froth appears at the inner corner of the eye, the lids swell, and in severe cases the eye-ball is entirely concealed, the nostrils are closed by the discharge drying around them, and the eye-lids are agglutinated together; the diseased secretion accumulates within to a great extent, consequently the sides of the face swell to an extreme degree, and the bird, unable to see or to feed itself, suffers from great depression, and sinks rapidly.

Roup is essentially a disease of the lining membrane of the nasal cavities. This being inflamed, becomes swollen, and secretes the discharge before men-

tioned. These two circumstances combined tend to close up the small external apertures of the nostrils; as fowls habitually breathe through the nose, the mouth being kept closed, it follows that there is, even in the early stages, some difficulty of breathing, and a distension of the loose skin below the under jaw may often be noticed. The frothy matter appearing at the corner of the eye results from the same cause; the air, stopped in its passage through the nose, passes up the tear-duct, leading from the eye to the nose, and produces the appearance of bubbles in the corner of the eye. In very severe cases the cavity of the nose becomes filled with the diseased secretion, which cannot escape, owing to the small size and closure of the nostril, and then the face swells considerably.

This disease is, undoubtedly, very contagious, and is frequently communicated by fowls drinking out of the same vessel, the discharge from the nostrils of the sick bird contaminating the water as it drinks.

Treatment.—Warm, dry lodging, and stimulating, nutritious food, are the first essentials to recovery; in addition, the frequent removal of the dried discharge from around the eyes and nose, by bathing in warm water, must not be omitted. In the way of internal medicine, nearly equal numbers recover under various modes of treatment. Iodine in tincture, mercurial ointment and nitrate of silver have been applied to the face without any advantage—many drugs have been given internally with no better results. The direct application of some remedial agent to the diseased membrane promises the best results; but here we are met by the difficulty of application, as the nostrils of the fowl are so closed that it is almost impracticable to pass anything through them. A very small bent tube can, however, be readily passed into the cavity of the nose through the slit in the roof of the mouth, and in this way a dilute solution of sulphate of copper (blue vitriol, at the rate of ten grains to the ounce of water,) has been used with very favorable results. The injecting tube is readily passed into each nostril, if inserted into the interior part of the slit seen in the roof of the mouth, and directed outwards at right angles to the slit. In most cases, however, Tegetmeier advises the use of the axe, as cure is difficult, and the risk of contaminating the yard is great.

PIP.

Symptoms.—The occurrence of a dry, horny scale upon the tongue is generally regarded as characteristic of this disease, which, however, is by some confounded with gapes. The dry, scaly tongue is, however, only a symptom caused by some other disease, which forces the fowl (that habitually breathes through the nostrils) to respire through the mouth; in this case the constant current of air dries the tongue, which becomes hard at the point, and assumes a very horny character. Thus, in any inflammatory affection of the windpipe, in gapes, catarrh, or roup, when the nostrils are closed by the discharge, the pip, as it is termed, makes its appearance. It should be regarded, however, as a symptom only, and not as the disease itself.

Treatment.—The treatment varies with the cause; if the scale of hardened membrane is loose, it should be removed. The absurd plan of nipping off the end of the tongue in chickens is practiced in some parts of the country; it is needless to say that it is alike useless and barbarous.

GAPES.

See "Diseases and Enemies of the Young Chick," page 25.

CONSUMPTION.

Symptoms.—Consumption, which is caused by the presence of scrofulous tubercles in the lungs, may almost always be induced in chickens by confining them in cold, dark, unhealthy places; tubercles have also been found in the liver and other parts of the body. The symptoms of consumption are not strongly marked in the early stages; in the more advanced state there is wasting, cough, and expectoration of matter.

Treatment.—It is fortunate that consumption can always be prevented by wholesome, abundant diet, and good housing, for in advanced stages it is quite incurable; where it is suspected to be commencing, cod-liver oil may be given mixed with meal; but as the disease is hereditary, a fowl so preserved would be worse than useless as a stock bird.

DISEASES OF THE EGG ORGANS.

The egg organs in the fowl consist of the ovary, situated on the fore part of the left kidney, and the oviduct, or egg-passage, leading from it to the outlet. The ovary in its inactive state consists of minute vesicles, the germs of future eggs. In its active condition these enlarge in regular succession, until each has attained the size of the natural yolk, when it is seized by the funnel-shaped extremity of the egg passage, and as it passes along has successively secreted around it the white, the membranes lining the shell, and lastly, the shell itself; the white being necessarily formed at the upper part, the membrane at the middle section, and the shell at the lower part of the oviduct, or egg-passage.

The ovary is not often subject to disease, except in old hens past laying, in which it sometimes degenerates; and it not unfrequently happens that the hen so affected is healthy in all other respects, and is only known to be diseased by her not laying and frequent crowing; sometimes, as in the case of barren hen-pheasants, she assumes the plumage of the male bird.

INFLAMMATION AND PROTRUSION OF THE EGG-PASSAGE.—SOFT EGGS.

Symptoms.—The symptoms of this complaint vary with the part of the oviduct affected. As the disorder occurs in laying-hens, we are enabled to trace the seat of the complaint by the state of the extruded egg. If the lower part is unduly excited, the egg is expelled before the shell has been secreted, and a soft-skinned egg results. If the inflammation extends to the middle portion, the membrane is either misshapen or incomplete; and if the whole tube is inflamed, the yolks are dropped without any covering whatever.

The laying of soft eggs arises from several causes; and if all cases are treated alike, such an empirical method will certainly not be followed by success. The shell of the egg consists almost wholly of carbonate of lime, the same material

which, in different forms, produces chalk, marble, limestone, and the shells of such animals as oysters, etc. The requisite quantity for the formation of the shell must be obtained in or with the food, otherwise soft eggs result. When unshelled eggs arise from a deficiency of calcareous matter, the remedy is evident. A quantity of old mortar rubbish, or oyster shells heated to redness and then broken up, readily supply the material required.

Another cause of soft eggs is the excitement of the fowl from being driven about, or being worried in any manner. Heavy fowls, such as Crevecœurs or Dorkings, etc., that are not so active as the smaller varieties of poultry, suffer much from being driven, frequently laying soft eggs afterwards. The remedy in this case is simple, being merely rest.

Inflammation of the oviduct, or egg-passage, is a third cause, and in this case the eggs produced are usually irregular in form, or very imperfect. When the inflammation is very severe the yolks may be expelled, as they are received from the ovary without any white or membrane; at other times the white may be expelled with the yolks, or the eggs may be imperfectly or irregularly inclosed in membrane. The treatment of inflammation of the egg-passage is sufficiently simple. The object is to lower the inflammatory action; and this is best done by the use of a remedy proposed some years since by Tegetmeier, namely, one grain of calomel and one twelfth of a grain of tartar emetic, given in meal. After its administration the hen generally ceases to lay for two or three days, and then resumes in a healthy manner; but if necessary a second dose may be given.

Inflammation of the egg-passage is shown by general feverishness; the feathers (especially those over the back,) are puffed out, and the hen mopes about, and strains to discharge the contents of the passage. This inflammation may be produced by over-stimulating or unwholesome food, such as greaves and spiced poultry foods; in these cases the disorder ceases without the use of medicine, on returning to natural food.

Protrusion of the lower end of the oviduct not unfrequently occurs in hens that are laying. It is sometimes caused by a disparity of size between the egg and the passage, and at other times seems connected with a general relaxation of the system. When protrusion occurs, the plan recommended is immediately to check the laying by the medicine above mentioned, and put the bird on a diet which contains little egg-forming material, such as rice and potatoes; and after a few days the parts usually regain their natural position. If, however, another egg is formed, it usually happens that the efforts to expel it so much increase the mischief that the bird dies.

Inflammation of the oviduct is not unfrequently the precursor of apoplexy; if a soft egg, as frequently happens, is broken in the passage, the collapsed membrane, from its irregular form, is not readily expelled, and the violent efforts to get rid of it lead to the rupture of a vessel in the brain; at other times, the canal being closed, additional yolks accumulate above, causing a tumor, which is eventually fatal, and which is rapidly enlarged by the continued secretion of the oviduct. Tumors of upwards of a pound in weight are sometimes produced in this manner. Should the membrane of a soft egg protrude, the fowl should be caught and the membrane drawn away with the utmost gentleness, or the oviduct itself will be drawn out.

DISEASES OF THE LIMBS.

LEG WEAKNESS.

Symptoms.—This disease usually occurs in young birds, and more frequently in cockerels than pullets. The bird affected is, more or less, unable to support itself, and sinks down on the hocks after standing for a short time, or in bad cases is even unable to rise on the feet. In other respects the health is good, the appetite being at first, before the health is injured by want of exercise, very good and the comb red.

Causes.—The cause of this troublesome complaint, which frequently attacks the finest and heaviest birds, is merely a rapid increase of weight, which is out of proportion to the muscular development; it consequently is more often present in cockerels than in pullets; it is rarer in old birds, and is most common in the heaviest varieties, Cochins and Brahmas being more especially subject to it. Constitutional weakness may, of course, produce it without any rapid growth.

Treatment.—Local applications are perfectly useless; but the most rapid improvement follows the administration of from three to eight grains of citrate of iron daily, and a due supply of nutritious food, care being taken to select such substances as are flesh-producing, and not fattening—wheat, barley, and a due supply of worms, or in default, a little chopped meat, being preferable to rice or Indian corn.

RHEUMATISM AND CRAMP.

Symptoms.—These diseases, though differing in their nature, arise so constantly from the same cause and are so readily removed by the same treatment that they may appropriately be placed together. A disinclination and inability to move the limbs, evidently not arising from mere weakness, or a permanently cramped condition of the toes, are sufficiently characteristic.

Causes.—Both disorders are caused by exposure to cold and wet, and the tendency to them may be much counteracted by preventing the fowls, during their earliest chickenhood, from running in wet grass early in the morning.

Treatment.—Good food, and a warm, dry habitation are generally effectual. When chickens are hatched at such times as January or February it must not be expected that any treatment can counteract perfectly the unnatural circumstances under which they are placed. If exposed, they suffer from cold, and if confined in close rooms, the want of fresh air, and of natural green and insect food, produce unfortunate results.

GOUT.

Symptoms.—Swelling of the feet, attended with a great degree of heat.

Treatment.—Give one grain of calomel at night, and three drops of wine of colchicum three times a day, taking care as to warmth, etc.

BUMBLE-FOOT.

Symptoms.—Dorkings are more especially subject to this disease. It commences by a small, wart-like body on the ball of the foot. This enlarges, and at

last ulcerates, producing so much mischief that the bird becomes lame and useless.

Cause.—The cause seems to be some slight injury from pressure on sharp stones; this sets up a low inflammatory action on the thick skin of the foot, which is followed by the formation of the swelling. The disease does not originate in the tendons, nor even in the dense fascial covering, but in the cutis or true skin.

Treatment.—From the low state of vitality in the feet of birds, and the inability to rest them when diseased, there is little hope of successful treatment in advanced cases. In early cases we have removed the corn-like tumors, and cauterized the part with nitrate of silver with success, but the adoption of low perches, which prevent the bird coming with violence to the ground on its descent, is the best remedy, inasmuch as prevention is in all cases better than cure.

DISEASES OF THE SKIN.

BALDNESS AND WHITE-COMB.

Symptoms.—White-comb is a hard and scurfy condition of that organ, to which the fowls kept in the confined stable-yards of large towns, and other unhealthy localities, or fed on bad food, are liable; in advanced cases the feathers fall off leaving the head perfectly bare.

Causes.—Unnatural food, the want of fresh vegetables, and overcrowding in dark habitations, are the causes of these complaints.

Treatment.—A return to natural diet is indispensable to success; and if to this important requisite be added the administration of five or six grains of jalap every other night for a week, and the application of sulphur ointment to the comb, immediate benefit will result. At the same time it must be borne in mind that the plumage will often not reappear until next moulting time.

SCALY LEGS.

Symptoms.—A congregation of infinitesimal parasites, which gather imperceptibly at first in the crevices between the edges of the leg-scales, and which increase rapidly in numbers—piling up on themselves, until they form into apparent grayish-white warts or rough bunches.

Causes.—The cause of this disorder is evidently contagious, but its progress may be much forwarded by want of cleanliness in the fowl-houses, and it cannot be eradicated except in connection with a thorough cleansing of the houses and roosts, as the insects will propagate in the filth.

Treatment.—Take a small pail, fill partly with water, and pour in some kerosene, which will remain on top of the water. Then take your fowl and dip its legs into the pail. After two or three minutes wash thoroughly with soap-suds, as this prevents any ill effects to the fowl from the kerosene.

LICE.

This trouble has been considered under the head of "Diseases and Enemies of the Young Chick."

The foregoing description of poultry diseases is taken from Tegetmeier's work. There remains, however, one disease to which neither Tegetmeier nor Wright have referred, yet which the American poultryman dreads more than all those we have named, and this is

CHICKEN CHOLERA.

A new light has recently been thrown upon the nature of this disease by the researches of D. E. Salmon, D. V. M., and of M. L. Pasteur.

The *Symptoms* of fowl disease are given by Dr. Salmon in his report on this disease to the Department of Agriculture, on investigations made during the year 1880, as follows:

"The first symptom of fowl cholera is, in the great majority of cases, a yellow coloration of that part of the excrement which is excreted by the kidneys, and which is normally of a pure white; it is this part of the excrement that I have called the urates. This yellow coloring matter appears while the excrement is yet solid; while the bird presents a perfectly normal appearance; while the appetite is good, and before there is any elevation of temperature. Indeed, it is frequently seen the second or third day after inoculation, and then may disappear for a week or more, to return one or two days before the other symptoms of disease.

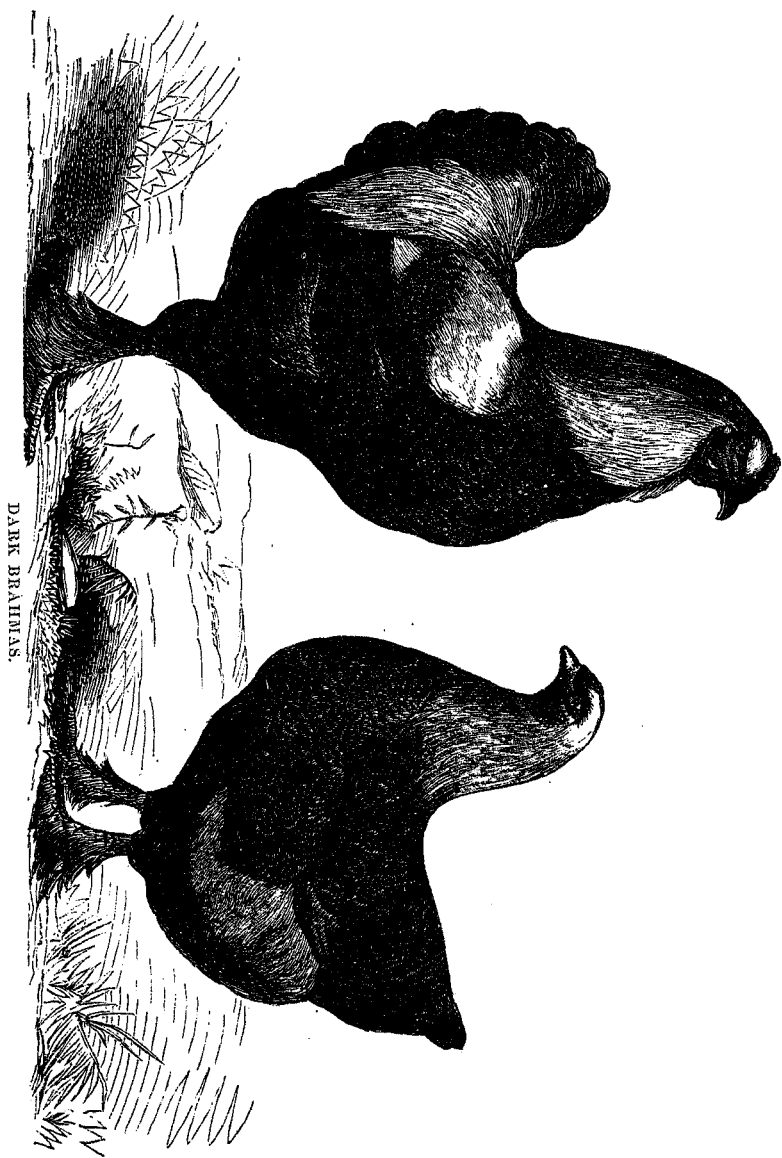
"In a very few cases the first symptom is a diarrhoea, the excrement being passed frequently and in large quantity, and consisting almost entirely of perfectly white urates.

"In all cases the diarrhoea soon becomes a prominent symptom, the excrement is voided frequently, consists largely of urates suspended in a thin, transparent mucus, and having a deep yellow coloration, which may, in the latter stages of the disease, change to a greenish, or even deep green color.

"With the beginning of the diarrhoea the temperature rises, reaching 109° to 110° Fah., or two to four degrees above the normal; the comb loses its bright hue and becomes pale and bloodless; the appetite is lessened; the wings droop; the bird becomes inactive. Frequently a good appetite is retained to the last, but often the bird is overcome by stupor and sleeps away the last day or two of the disease; in such cases they are only aroused with difficulty, a touch or blow being required.

"In the last stages of disease they have lost greatly in weight, are exceedingly weak, fall over by a touch, and walk with the greatest difficulty. Death frequently occurs without a struggle, but in the majority of cases there are convulsions and cries.

"The duration of the disease varies greatly. Sometimes the bird dies within twenty-four hours after the first coloration of the urates, and when but one or two liquid dejections have occurred; in other cases life is prolonged for three, four or five days, and occasionally for one, or even two weeks. The crop is generally distended with food, and loses the ability to force this onwards to be digested. In all cases except those of the shortest duration the feathers about the anus become soiled with the discharges. If the birds are aroused from their



DARK BRAHMAS.

sleep and made to walk, there is at first an abundant evacuation, followed at short intervals by scanty discharges, which, with the frequent contractions of the sphincter ani, are evidence of considerable irritation of the posterior part of the intestinal canal.

"In most cases affected birds are very thirsty throughout the whole period of the disease; frequently, however, the thirst is not exaggerated, and in exceptional cases they scarcely drink at all.

"*Post-mortem appearances.*—The comb is pale and bloodless, but neither dark nor dark blue, as seems to be the case in France. The superficial blood-vessels generally contain but little blood, and there are, in most cases, soiled feathers about the anus to which the excrement may adhere in considerable quantity.* On opening the body the first organ to attract attention is the liver, which in nearly every case is enormously enlarged and softened, with the blood-vessels very apparent; it is often of a very dark or dark green color, is frequently attached to the surrounding parts by false membranes, and is as often surrounded by a transparent, colorless effusion. In exceptional cases its appearance is nearly or quite normal. The gall-bladder is generally greatly distended with thick, dark bile, which has frequently passed through its walls in sufficient quantity to stain all the organs in its vicinity.

"The crop is generally distended with food, though no special lesions have been noticed here. The proventriculus, or true stomach, viewed externally, often presents a number of circular discolorations, about one tenth of an inch in diameter, which on section are found to be small clots of extravasated blood. No lesions have been found in the gizzard. The small intestines are usually congested; often the mucous membrane is nearly black from engorgement of the blood-vessels, and occasionally the internal surface is the seat of ulcerations of various size and number. In one case a fibrinous plug had formed about midway of the small intestine, completely obstructing the passage of the bowel contents; this plug was three inches long and very firm.

"The rectum and cloaca generally present deep red lines upon their mucous membrane, evidently the first stage of inflammation, which results in chronic cases in thickening of the walls, especially of the rectum, the desquamation of the mucous membrane, and the formation of large ulcerous surfaces. In some cases this thickening and ulceration extends into the colon, and it is generally seen in the chronic or sub-acute forms of the disease in the cæca, the walls of these being thickened, denuded of their mucous membrane, and the cavity filled with a plug of coagulated lymph.

"The mesentery is generally congested, often thickened and rendered opaque by inflammation; the ureters are distended with yellow urates; the kidneys seem engorged, and on section accumulations of the tenacious, yellow urates are frequently seen; the spleen is generally normal in size and appearance, though frequently enlarged and softened. The pericardium is sometimes distended with effusion, in which cases there is noticeable hyperæmia of the surface of the heart. The lungs are often, though not generally, engorged with dark blood; they are seldom, if ever, hepatized. The blood-vessels are sometimes filled with

a firm clot, and contain but little liquid; at other times the blood does not coagulate at all. It seems to be those cases where the duration of the disease has been longest in which the blood loses its property of coagulation.

"In the few cases examined by me in which the disease was contracted from infected premises, etc., the lymphatic glands along the neck appear much more congested than in cases which resulted from inoculation, indicating, as suggested by Toussaint, that the virus had been taken with the food and absorbed from the mouth or pharynx.

"The brain, in the cases examined, has either been normal or not very perceptibly altered. The muscles at the seat of inoculation are generally reddened, though sometimes perfectly normal; in a few cases, at the point of inoculation the tissue has been transformed into a whitish, rather firm substance, without definite outline, but disappearing imperceptibly into the substance of the muscle; exceptionally this has separated from the muscular tissue, and exists as a clearly circumscribed *sequestrum*."

We have given these symptoms at length, because fowl cholera is frequently confused with other diseases, as simple diarrhoea, roup, etc., and successful treatment depends, of course, upon a correct diagnosis of the case.

Causes.—The cause of fowl cholera is unquestionably, in the great majority of cases, contagion. Whether this contagious principle be one of the forms of bacteria, like that to which anthrax fever in cattle and sheep has been traced, and to which eminent authorities believe the swine-plague, or hog cholera, as well as poultry cholera, to be due, is not yet conclusively settled.

Bacteria are microscopic organisms, probably vegetable in their nature, which propagate in putrefying flesh after the manner of the yeast plant or the moulds, and are the active agents of decay. Similar organisms have been found existing in immense numbers in the blood of animals suffering from contagious disease, and many pathologists believe them to be the cause and vehicle of contagion of such diseases.

However this may be, the experiments of Salmon, Pasteur and others, have shown that fowl cholera is not communicated by simple contact, like measles and small-pox in the human subject, since healthy fowls may be penned alongside of those suffering with the disease without being affected. If, however, the flesh of diseased fowls be fed to healthy ones, or if the latter be allowed to run over grounds containing the excrement of diseased fowls, contagion is sure to follow. The disease may also be propagated by inoculating the healthy fowl with blood or tissue from a diseased one.

Treatment.—Dr. Salmon says: "Medical treatment of sick birds is not to be recommended under any circumstances. The malady runs its course, as a rule, in one, two, or three days, and it can only be checked with great difficulty. As the appetite is very poor, medicine can only be administered regularly by taking each bird by itself and forcing it to swallow. But this requires too much time to make it advisable, if there were no other objection to the practice. Even in those cases in which I have succeeded in prolonging the life for two or three weeks, death has finally occurred from profound changes in the liver and intestines. The great reason, however, for not treating sick birds is that the excrement is probably filled with the contagion, and it is much better to destroy them

at the start than to keep them to multiply the contagious germs and infect the grounds and remaining fowls."

The only practicable treatment, therefore, is *prevention*; for the accomplishing of which we quote the following rules deduced from Dr. Salmon's report by a correspondent of the *Scientific American*:

"Measures for prevention of fowl cholera should be based upon the following facts:

"1. *The virus is not diffusible.*—That is, the disease germs are seldom if ever taken up by the air and carried any considerable distance to produce the malady. The virus remains in the fixed form, and is generally if not always taken into the body with the food; it is distributed over the grounds, feeding places, etc., in the excrement of affected birds, and the food, drink, and gravel are thus contaminated. Healthy birds may be kept in coops within a few feet of the sick ones for months without contracting the disease; but if the former are now placed in the same inclosure with the latter, they sicken in a few days.

"2. *The virus must be carried upon the grounds frequented by fowls before they contract the disease.*—It is not probable that this disease originates in any considerable number of cases in any other way than by contagion. There is a possibility that it may originate in occasional instances by filthy surroundings, if closely confined, or by feeding on decomposing substances; but there are few facts to support such a conclusion.

"It is thus brought upon farms either (1) with sick or infected fowls newly acquired, (2) with the blood or parts of the bodies of dead birds carried on the feet of people or brought by dogs or other animals, (3) with infected manure or feathers, or (4) possibly by wild birds, animals (rabbits), or even insects that have contracted the disease or have eaten the blood or bodies of affected birds recently dead. The origin of the disease can generally be traced in country districts where houses are a considerable distance apart, to recently acquired poultry. It is only in districts more thickly peopled, and then in exceptional instances, that the germs are carried by wild birds or animals or by insects.

"For grounds not already infected the following precautions should be observed:

"1. *Newly acquired birds to be isolated.*—When cholera is raging in a locality, all birds introduced from other flocks should be placed in an inclosure by themselves for at least three weeks, until it is certain that they are free from the disease. No fowl should be accepted from a place known to be infected, for at least a year after the last known cases occur.

"2. *Precautions in regard to eggs.*—All the eggs from a distance to be used for hatching must be thoroughly cleaned of all particles of excrement adhering to them, and the water with which they are washed, as well as cloths or brushes used, must be raised to the boiling point before being thrown upon grounds to which poultry has access. The virus is always destroyed by a boiling temperature, or even by 140° F. if maintained for fifteen minutes.

"3. *Fowls not to wander upon adjoining infected premises.*—A stone wall is in towns frequently the boundary line of an infected place, and though fowls are upon each side of it the contagion may not cross for years. In such cases it is a matter of the greatest importance to prevent the healthy fowls from trespassing upon the infected grounds.

"4. *Fowls from neighboring infected premises to be rigidly excluded.*—If it is important to keep healthy fowls from infected grounds, it is not less important to exclude fowls living in infected quarters from entering on runs that are still free from the disease. Even though insusceptible to cholera and consequently healthy, they are able to carry the virus on their feathers and feet, and may even distribute it with their own excrement; for although the virus is unable to propagate itself in the blood and tissues of insusceptible birds, there is reason to believe that it may still multiply in the contents of their digestive organs.

"5. *Other infected substances to be excluded from the runs.*—Manure from infected places is often purchased and spread upon land to which healthy poultry has access, and thus becomes the means of spreading the disease. This should either be entirely excluded from the farm or the fowls should not be allowed to come near to where it is placed. It cannot be safely disinfected. Feathers and dead birds are also at times carried a considerable distance by various agencies, and should be guarded against when possible.

"If sickness appears among the flock we should ask:

"1. *Is the disease cholera?*—Fowls frequently die in considerable numbers from diseases that are not contagious, and hence it is a matter of primary importance to decide as to the nature of the affection when cholera is suspected. In my own experience I have found that this might be done with comparative certainty by inspection of the excrements. With fowls the excretions of the kidneys are joined in the cloaca with the undigested parts of the food, and both solid and liquid excrement are consequently voided together. They are not mixed to any great extent, however; the part excreted by the kidneys is easily distinguished, as during health it is of a pure white color, while the bowel discharges are of various hues. The kidney excretion will hereafter be referred to as *the urates*, and it is the only part which claims our attention.

"After a fowl takes the contagion into its body, the first and only reliable symptom is a coloration of the urates. At first these have only a faint yellow tint, which rapidly changes, however, into a deep yellow color; up to this time the bird shows no other signs of the disease, its temperature is unchanged, and its excrement of a normal consistency. In one or more days after this yellow color appears, the urates are greatly increased in quantity, and constitute the whole or a greater part of the discharges and an obstinate diarrhoea sets in; in a few cases the urates now become greenish, and exceptionally they are of a deep green color.

"The only lesion seen in post-mortem examinations that is likely to attract the attention of non-professional observers is the enlarged liver, which is nearly constant; it may be of various shades of color. Besides this the presence of yellow urates in the cloaca and ureters is a valuable sign and is generally present.

"2. *Sick birds must be destroyed.*—The excrements of sick birds are the principal means of spreading the contagion, and the first step in stamping out the disease is consequently to destroy all which are voiding yellow urates. Care should be had to make the distinction between the urates and the bowel dejections, for the latter are frequently of a yellow color in health; but a little observation will preclude any mistake of this kind. The killing should not be by any method

which allows the escape of blood, as this fluid is even more virulent than the excrement; wringing the neck is a quick and easy method of destroying the life. Once killed, the bodies are to be taken beyond the limits of the poultry-run and deeply buried.*

"If it is decided to keep the sick birds till they die or recover, they should be placed in an inclosure by themselves, as far as possible from the healthy ones, where they may be cared for without entering, so that there will be no danger of carrying particles of the excrement on the boots.

"3. *Healthy birds must be placed on disinfected grounds.*—If a piece of land is at hand to which the sick birds have not had access, and which is consequently free from the contagion, the healthy birds should be penned upon it; but if all the land is infected, then a piece is to be selected and thoroughly disinfected with the solution mentioned further on in this book. The fowls are to be restricted to this disinfected ground for several months, or even a year or more if practicable. The drinking-vessels and feeding-troughs are to be new, or if used before they must be soaked for twelve hours with the same solution before being placed in the new inclosure.

"4. *Observations to be continued to note the first reappearance of the disease.*—Some of the fowls, though well at the time of removal to disinfected quarters, may be infected with the disease, and after the period of incubation, which varies from three to twenty days, will sicken. It is necessary, therefore, to make a careful inspection of the excrement each morning for at least three weeks after the separation of the sick fowls. If yellow urates are discovered the birds must be watched until the sick one is detected. To facilitate the early discovery of such sick fowls and prevent infection of the healthy ones, it is advisable, where practicable, to separate the birds into lots of two or three each at the start; and this separation may always be practiced as a last resort where the disease successfully defies our efforts for a considerable time; but where this is impossible a little patience will generably enable one to pick out the sick before any harm has resulted. As soon as the sick bird is removed the excrement must be scraped up and burned, and the run must be again sprinkled with the disinfectant; or the well birds may be changed to fresh ground as before. This method of management is to be continued as long as new cases of the disease occur.

"5. *Disinfection.*—For this disease we have a very cheap and most effective disinfectant. It is a solution made by adding three pounds of sulphuric acid to forty gallons of water (or one fourth pound of acid to three and one half gallons of water) and mixing evenly by agitation or stirring. This may be applied to small surfaces with a common watering-pot, or to larger grounds with a barrel mounted on wheels and arranged like a street-sprinkler. In disinfecting poultry-houses the manure must be first thoroughly scraped up and removed beyond the reach of the fowls; a slight sprinkling is not sufficient, but the floors, roosts, and grounds must be thoroughly saturated with the solution, so that no particle of dust, however small,

*Not buried, but burned. The futility of burial for the eradication of such diseases as this is shown by the fact that their germs have been found by Pasteur in pits where animals that had died with splenic fever had been buried for twelve years, and as virulent as in animals recently dead. The same scientist has shown that these germs are propagated from burial-pits through the agency of earth worms.—[ED.]

escapes being wet. It is impossible to thoroughly disinfect if the manure is not removed from the roosting places.

"Sulphuric acid is very cheap, costing at retail not more than twenty-five cents a pound, and at wholesale but five or six cents. The barrel of disinfecting solution can therefore be made for less than a dollar, and should be thoroughly applied. It must be remembered, too, that sulphuric acid is a dangerous drug to handle, as when undiluted it destroys clothing and cauterizes the flesh wherever it touches. The safest way is, therefore, to take a five-gallon keg nearly full of water to the druggist and have him place the strong acid in this; the contents of the keg may then be safely transported and added to the barrel of water.

"6. *Fumigation*.—In those cases where the disease has been raging for a considerable time the feathers become saturated with the contagion, and it is necessary, before placing the fowls on the disinfected run, to put them in a close building and thoroughly fumigate them with sulphur. For this purpose a pan of burning coals is taken and flowers of sulphur thrown upon them as long as the air can be breathed without danger of suffocation. When the disease is recognized at the outset this is not necessary.

"By a careful observance of these rules the fowl cholera may be excluded indefinitely, and may be exterminated when it has made its appearance. The writer has had a very virulent form of the disease among experimental fowls for nearly eight months, and though his home flock is but a short distance from them, but a few of these have sickened, and the disease has been checked with the loss of a single bird in each instance. It is believed that the birds which thus contracted the disease were infected by flies, which would gorge themselves with virulent blood in the laboratory, where dissections were made, and then fall victims to the poultry which were running about outside. No cases have occurred in this manner since the cold weather has destroyed these insects."

Prevention by vaccination.—The researches of M. Pasteur have shown that the virus of this disease may be so modified by cultivation as to communicate the disease in a much less virulent form, bearing the same relation to the genuine chicken cholera that varioloid does to small-pox; and as one attack of the disease gives immunity from it thereafter it is hoped that this discovery may lead to practical results. Pasteur has already demonstrated its practical utility in the kindred disease among sheep, called charbon in France, or splenic-fever in England, and which is said to cause an annual loss in France of four millions of dollars. Fifty sheep were placed at his disposal, of which twenty-five were vaccinated with cultivated virus of the charbon disease. A fortnight afterward the fifty sheep were inoculated with uncultivated or virulent virus. The twenty-five vaccinated sheep resisted the infection; the twenty-five unvaccinated died within fifty hours. This experiment so awakened the farmers of the environs of Paris that in the space of fifteen days Pasteur was called upon to vaccinate more than twenty thousand sheep, and a large number of cattle and horses.

The process by which this modified virus was obtained is thus described by Pasteur in an address delivered at the International Medical Congress in London, August 8, 1881:

"Let us take a fowl which is about to die of chicken cholera and let us dip the end of a glass rod in the blood of the fowl with the usual precautions, upon which I need not here dwell. Let us then touch, with this charged point, some chicken broth, very clear, but rendered sterile under a temperature of 115° Centigrade, and under conditions in which neither the outer air nor the vessels employed can introduce exterior germs—these germs which are in the air or on the surface of all objects. In a short time if the little culture-vase is placed in a temperature of 25° to 35° , you will see the liquid become turbid, and full of tiny microbes, shaped like the figure 8, but often so small that, under a high magnifying power they appear like points. Take from this vase a drop as small as you please—no more than can be carried on the point of a glass rod as sharp as a needle—and touch with that point a fresh quantity of sterilized chicken broth placed in a second vase, and the same phenomenon is produced. You deal in the same way with a third culture-vase, with a fourth, and so on to a hundred, or even a thousand, and invariably, within a few hours, the culture liquid becomes turbid and filled with the same minute organisms. At the end of two or three days' exposure to a temperature of about 30° Centigrade, the thickness of the liquid disappears, and a sediment is formed at the bottom of the vase. This signifies that the development of the minute organism has ceased; in other words, all the little points which caused the turbid appearance of the liquid have fallen to the bottom of the vase, and things will remain in this condition for a longer or shorter time—for months even—without either the liquid or the deposit undergoing any visible modification, inasmuch as we have taken care to exclude the germs of the atmosphere. A little stopper of cotton sifts the air which enters or issues from the vase through changes of temperature.

"Let us take one of our series of culture preparations—the hundredth or the thousandth, for instance—and compare it, in respect to its virulence, with the blood of a fowl which has died of cholera; in other words, let us inoculate under the skin ten fowls, for instance, each separately with a drop of infectious blood, and ten others with a similar quantity of the liquid in which the deposit has first been shaken up. Strange to say, the latter ten fowls will die as quickly, and with the same symptoms as the former ten; the blood of all will be found to contain after death the same minute infectious organisms.

"Let us now repeat exactly our successive cultures, with this single difference, that we pass from one culture to that which follows it—say from the one hundredth to the one hundred and first, at intervals of a fortnight, or one, two or three months. If, now, we compare the virulence of the successive cultures, a great change will be observed. It will be readily seen, from an inoculation of a series of ten fowls, that the virulence of one culture differs from that of the blood, and from that of a preceding culture, when a sufficiently long interval elapses between the impregnation of one culture with the microbe of the preceding. More than this, we may recognize by this mode of observation, that it is possible to prepare cultures of varying degrees of virulence. One preparation will kill eight fowls out of ten; another, five out of ten; another, one out of ten; another, none at all, although the microbe may still be cultivated. In fact, what is no less strange, if you take each of these cultures of attenuated virulence as a point of departure in the preparation of successive cultures, and without ap-

preciable interval in the impregnation, the whole series will reproduce the attenuated virulence of that which served as the starting point. Similarly, when the virulence is small, it produces no effect."

Professor Pasteur proceeds to show that this decrease of virulence in the disease-germ is due to continued exposure to the oxygen of the air, and that it may be continued to such a point as shall cause the vaccination of the fowl with it to produce more or less complete immunity from subsequent attacks, and yet cause little or no inconvenience to the fowl itself. If the virus be very much weakened it may require several vaccinations to give complete immunity—three or four being found necessary in some of Pasteur's experiments, and the operation may require to be repeated at intervals of a year. This discovery is yet in its infancy, but it is worthy of extended and careful investigation.

Prevention by breeding from insusceptible fowls.—Dr. Salmon states that he has found a considerable number of fowls that were capable of resisting repeated inoculations with very active virus, some showing only the mildest symptoms of

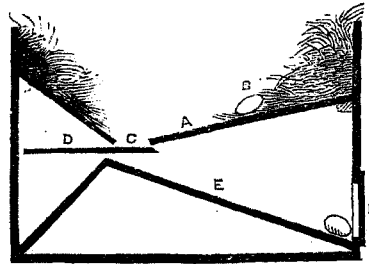


FIG. 27.

the disease, and others remaining entirely free from any appreciable results, either in general health or at the point of inoculation, and Chauveau has shown that the Algerian sheep are, as a breed, insusceptible to the influence of charbon, hence they urge the importance of breeding from such animals, with the hope of producing strains that will possess this characteristic in a still greater degree.

If there is reason to fear that the flock has been or is likely to be exposed to the contagium of fowl cholera we should advise the use of hyposulphite of soda in their drinking water, at the rate of an ounce to the pailful of water. If the yellow coloration of the urates appear before a fowl shows other signs of disease the use of the homeopathic preparation of strychnine called *Nux Vomica* three may be of service, five or six pellets to be given to a large fowl once a day, and a smaller number to a smaller fowl. This remedy has given good results with us, when used in time. Dr. S. J. Parker writes to the *Country Gentleman* that he has found *Eucalyptus globulus* very serviceable at this period of the disease, by relieving the indigestion which is among the earliest symptoms. Ten drops of the strong tincture are given with four grains of salt and half a teaspoonful of ground cayenne pepper in a teaspoonful of water.

EGG AND FEATHER EATING.

These are pernicious habits, rather than diseases. They are induced in the first place by deprivation of animal and grain food, or allowing eggs to freeze in the nest, or by too close confinement, and when once acquired are communicated to other fowls in the yard.

The remedy is to give a due supply of meat, green vegetables and bones in the food, and if that does not cure to use the axe, which never fails. Should it be desired to preserve an egg-eating hen during her period of laying, her eggs may be saved by the use of the nest-box shown in Fig. 27. Feather eating is harder to circumvent. The preventives are plenty of food and plenty of range; but when the habit is once acquired it is very difficult to break it up. The chopping block is the surest remedy, but for valuable fowls a wire bit passed through the mouth like a horse's bit and held in place by being passed through the comb, the wire being just large enough to prevent shutting the beak firmly together, will render the bird unable to grasp the feathers, and it will soon abandon the habit. A patented appliance for this purpose is called the "Loomis Poultry Bit."



CHAPTER VIII.

THE BREEDING OF FANCY POULTRY.

The breeding of fancy poultry is a business which requires for its successful management a thorough knowledge of the laws which control animal reproduction; and even the non-professional poulterer will find such a knowledge essential to the most economical management of his flock. The complete discussion of these laws cannot, of course, be entered upon in such a work as this, but a few of the facts most fully established will be referred to.

Thus it has been conclusively proven that the *first connection* of the female with the male exercises so powerful an influence over the former that its effects are never wholly eradicated, hence it is essential to the maintenance of perfect purity in the various breeds of our poultry-yard that they be never allowed to intermingle.

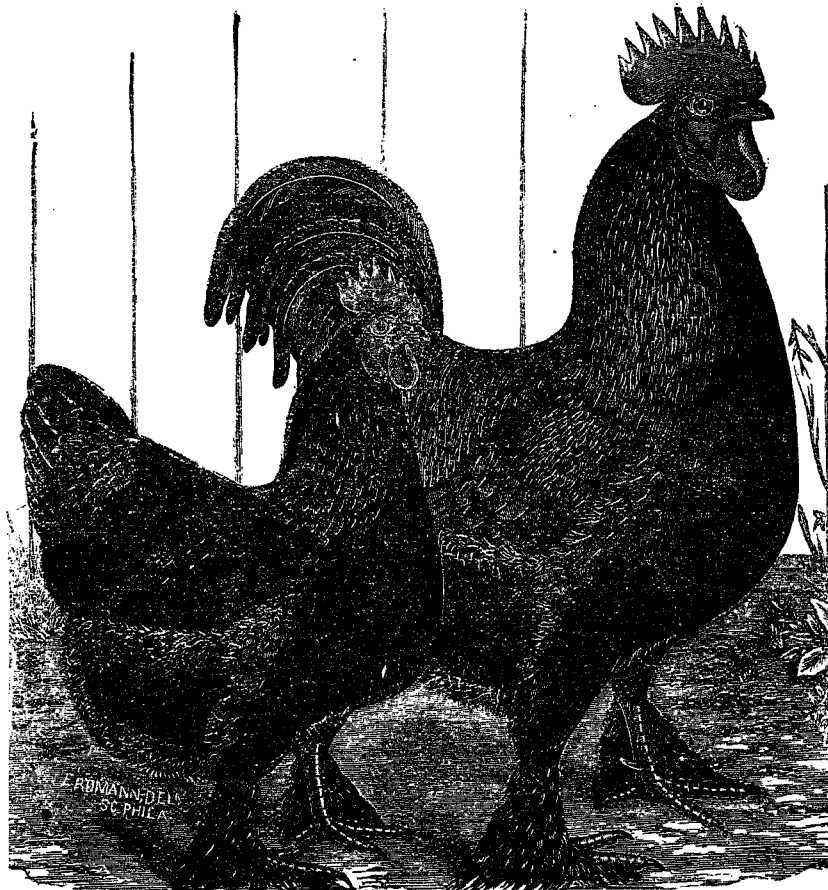
In Prof. Miles excellent work on "Stock Breeding," this subject is exhaustively discussed. From it we make the following extracts:

"Mr. W. H. Smith, of Lexington, Kentucky, makes the following statement: On or about the first day of February, 1873, I loaned a prime Dark Brahma cock, that was a good, vigorous bird, to Mr. James Fought, of this city. He put him with a lot of Light Brahma hens, with which a Houdan cock had been running previously. The hens laid, set, hatched and raised their chicks, laid and hatched again, and the second litter of chicks still had the Houdan marks. There was no Houdan blood in the Light Brahma hens, neither was there any other cock with the hens from the time he got the Dark Brahma cock."

"Mr. A. W. Frizzell, of Baltimore county, Maryland, makes the following statement: 'I once purchased a trio of pure-bred Dark Brahma fowls from a breeder of no small note, and a trustworthy man (I speak from experience, for I was once employed by this gentleman, and do know him to be trustworthy), which fowls had taken the premium at the Carroll county (Kentucky) fair in 1871. I brought those fowls home, and in the yard was also a Light Brahma cock, which I did not dispose of for some time, and in the mean-time he was mating with these dark hens; any effects of this I thought would soon run out. After a while I disposed of the light cock, and kept none but the dark one, nor had none nearer than a mile. Nevertheless, three years afterward, I see light, or half light, chicks coming from those two hens.'

"A Mr. Payne, in England, had two Spanish pullets running with both a Spanish and Cochin cock. After they began to lay the Cochin was removed, and *six weeks later* the eggs were saved and set; but the chickens were feather legged, though in all other points resembling the Spanish.

"On another occasion the same gentleman allowed a Black-red Game hen, which laid while with chickens, to run a few hours with a Brown-red cock, and nine eggs produced chickens which all resembled the father, or Brown-red.



LANGSHANS.

"Another English gentleman, when residing in Canada, sold his Brahma cock and one hen, allowing the hen left to run afterward with a Spangled Hamburg cock which had five hens of his own. Every egg laid for ten days produced a pure Brahma chick; that on the eleventh day was a half-breed.

"In America a Mr. Woodward bought in March some Spanish pullets which had been running all the winter with a native cock, and, though no eggs were set till two months after purchase, all the chicks even then showed the native points in a high degree.

"Another gentleman breeding Games, finding a neighbor's feather-legged Bantam cock come over his fence, penned his fowls in securely, and saved no eggs for a month after; but several chicks still had feathered legs, though with no other sign of the cross.

"Mr. E. W. Barnes, of Plympton, allowed a neighbor's Brown Leghorn cock to pass three days among his pen of eight one-year-old Light Brahma pullets, 'for experiment's sake,' he said. The Brown Leghorn cock was removed, and he has never once had anything on his premises since but the Light Brahmas of both sexes, 'pure.' From eggs set within a week after the Brown Leghorn cock was sent home, a third of the chicks, when hatched, came brown, speckled-brown, or patched with brown, that same summer. Out of the eight hens he saved four, and mated them only with a Light Brahma cock, yet more than one quarter of their chicks came spotted, speckled, and splashed with brown feathers for two years after the Brown Leghorn cock was dead.

"Mr. Charles H. Edmonds, of Melrose, allowed a Sebright cock to run for a few weeks with his Light Brahma fowls. In the fall his light Brahma chicks were marked with distinct Golden Sebright feathers and for two years succeeding the marking showed itself on scores of his chicks, from this very flock of Light Brahmas, when the Sebright cock had been gone from his premises over two seasons." *

The above are only a few of the examples quoted by Prof. Miles, and including horses, cattle, sheep, swine and man, which prove conclusively the fact—whatever may be the explanation of it—that the influence of the first copulation of the female extends throughout the larger part, if not the whole, of her life. It would seem that this fact might be made use of by skillful breeders in cases where it was desired to infuse into a breed some special characteristics of another breed, such as a greater hardiness of constitution, special markings of plumage etc., in a smaller degree than would result from a complete cross. It has long been customary to "throw in" a cross for such purposes, and then breed it out again, but it would seem that the same result might sometimes be accomplished more quickly by the process indicated.

Atavism is another of the mysterious influences which come, sometimes to the assistance, sometimes to the vexation, of the breeder. By *atavism* is meant the tendency of characteristics of remote ancestors to re-appear in their grandchildren, or even in descendants yet more remotely removed, although but slightly manifested, if at all, in the nearer descendants. Or, in other words, the tendency to return to original types of structure and character. This is a form of

*Stock Breeding, by Manly Miles, p. 269, Et. Seq.

heredity, but is distinguished from heredity proper, in that it appears only at intervals of two or more generations.

Thus Mr. Darwin states that a gentleman crossed his fowls with Malays, and, though he attempted to get rid of this strain, he gave it up in despair, the Malay characters reappearing forty years after the cross was made. *

Mr. Hewitt states that the Rumpless fowls in some instances produce young with tail feathers, but that, when three such birds were selected to breed from, there was but one chick with a tail out of over twenty bred from the trio. †

The tendency of Berkshire hogs to show occasional patches of sandy hair is a familiar illustration of this principle, one of the ancestors of the Berkshire having been a black and white and sandy spotted hog. ‡

In the human family instances of atavism have been so frequently noticed that Prof. Agassiz has remarked that "the offspring is not the offspring of father and mother only, but of the grandparents as well."

The influence of *heredity* upon the character and constitution of the offspring has long been partially acknowledged, but, partly owing to the confusion incident upon the workings of the before-named laws, the value of this influence has not been fully appreciated. Upon this principle depends, in fact, all possibility of improvement in our animals and plants, for no permanent advancement can be made unless the improvement gained may be fixed and perpetuated. As greater knowledge is obtained this influence becomes more and more apparent, however, and the means for availing ourselves of its effects better understood, so that we may reasonably hope to accomplish far more in the future than we have in the past in the way of improvement of our domestic animals, if not of ourselves.

In-breeding, or the mating of fowls that are near of kin, is strongly condemned by most poulterers; the impression being very prevalent that while such mating may result in improved appearance of the offspring, it is certainly followed by impaired constitution. This question is not yet fully understood. There can be no denying the fact that a vast improvement has been accomplished in our cattle and sheep by very close breeding, but this improvement was effected in the hands of very skillful breeders, and while the testimony of fowl breeders is so united against the process as it is at present, it will be safer for beginners to avoid the practice.

Cross-breeding is the opposite of in-breeding, and by it many of our varieties of domestic animals have been originated, although in many cases a cross has afterwards been followed up by close in-breeding in order to fix and perpetuate the characteristics obtained. The object of cross-breeding, is of course, the improvement of the progeny, either in constitution, or in some useful quality; but whatever this object may be, it should be definitely fixed and carefully kept in view, else the process will result only in harm instead of benefit. The improvement made in our native cattle by the introduction of the Short Horn blood is one of the most striking examples of the benefits to be derived from the intelligent use of this process. But this improvement was not due simply to the fact that the Short Horn bull was in himself a better animal than the cow upon

*Variation of Animals and Plants under Domestication. Vol. 11, p. 49. †Tegetmeier's Poultry Book, p. 231. ‡Youatt.

which he was bred, but that his superiority was the result of many generations of careful breeding, during which his superior qualities had been so firmly fixed that no ordinary shock would destroy their tendency to perpetuate themselves.

There is in Scotland a breed of black-faced mountain sheep, whose origin dates beyond tradition, and which received no fresh blood for several centuries. These sheep are very muscular and active, and remarkably hardy, as they would need to be to endure the exposures and privations incident to life upon their storm-beaten mountain home. "They instinctively herd together in storms, and although completely buried in snow-drifts, will manage to push the snow from their bodies, and form a cave over them, in which they will live upon what scanty herbage may be within their reach, until help comes. Thus buried, these sheep have lived for two or three weeks before they have been found and extricated." * It was attempted to improve this black-faced breed by infusing into it the blood of the Cheviot sheep, a breed inhabiting the hilly parts of the Scottish lowlands, and claiming almost as great an antiquity of origin as the black-faces.

"In this cross," says the intelligent Scotch shepherd, William Hogg, 'the independent habits of the mountain flocks were lost, and a mongrel progeny, of a clumsy figure, occupied the lowest and warmest of the pastures.' The cross-bred animals, although retaining largely the characteristics of the original breed, were not able to withstand the 'hardships and cold of winter,' and they required better care and better pastures than the old race had been accustomed to.

"Another truth which the process of changing a numerous stock has disclosed is, that in the produce of the first crop, and for several successive issues, the figure, wool, and other qualities of the Cheviot ram, are most conspicuous in the smallest and feeblest of the progeny; while the properties of the mountain breed are more fully exhibited in the strongest and most robust of the lambs. This misled many of the store-masters. They did not consider that there was as much Cheviot blood in the coarsest (as they were pleased to call them) as in the finest; though not so clearly exhibited in its external qualities. This induced them to throw aside the best of the lambs and select those to breed from which had apparently most of the Cheviot figure. This was an additional disadvantage; for, as it prevailed wherever the experiment was tried, the mountain flocks, in general, were smaller and feebler than they were ever known to have been; and were, consequently, more vulnerable to bad seasons, a course of which happened to accompany the change.'

"The stability of the characteristics of the old mountain breed was shown in the readiness with which the cross-bred animals were 'bred back' to the original type, and the frequent appearance of the old characters by atavistic descent after an effort of twenty-five years to establish the peculiarities of the Cheviot." †

A similar difficulty was experienced when it was attempted to cross pure-bred English rams upon the old established breeds of France; the intensified heredity of which, or *prepotency*, as it is technically termed, and the lack of adaptation in the English stock to the climate and system of management to which it was subjected, resulting in the production of a cross which proved fatally defective

* Stewart's Shepherd's Manual, p. 122. † Miles' Stock Breeding, p. 193.

in constitution; but when the prepotency of the French stock was broken by a mixture of breeds, before the introduction of the English blood, the resulting progeny produced a grade of sheep of very uniform qualities, and so closely resembling the English stock as only to be recognized as a cross by an experienced eye; yet, at the same time, adapted to the circumstances of their continental home.

In this way the Charmoise breed of France was produced, the hereditary tendencies of the French ewes having been obscured by the mixture of four of the native breeds, so that when the first cross was made with the English rams the produce would consist of fifty per cent. English blood, but of only twelve and a half per cent. each of the various French breeds.*

But this discussion brings us to the question, *What is a pure breed?* Upon this point we cannot do better than to reproduce the following article from the pen of Mr. Tegetmeier:

"A considerable amount of uncertainty finds its way into type respecting what may be termed pure breeds of domestic animals. Such questions as the following are constantly asked: 'Are Brahmas a pure breed?' 'Are Black Hamburgs a pure breed?' etc., etc. These queries obviously owe their origin to a confusion of the distinction that exists between different species of animals, and between different varieties of the same species. Let us illustrate our meaning by an example or two:

"A hare is a pure-bred animal, because it is totally distinct from all other animals, or, as naturalists say, it constitutes a distinct species. It does not breed with other animals, for the so-called leporines are only large rabbits; and if it did, the offspring would be a hybrid or a mule, and almost certainly sterile, or incapable of breeding. In the same manner the common wild rabbit is a pure breed. This animal possesses the capability of being domesticated, and under the new circumstances in which it is placed, it varies in size, form, and color from the original stock. By careful selection of these variations, and by breeding from those individuals which show most strongly the points or qualities desired, certain varieties, or, as they are termed, 'breeds' of rabbits, are produced and perpetuated. Thus we have the lop-eared breed; the Angora breed; the Chinchilla breed, etc., etc., characterized by alterations in the length of the ears, in the color of the fur, in the size of the animals, and so on. It is obvious that, by more care, more new varieties may be produced and perpetuated. Thus, by mating silver-greys of different depths of color, white animals with black extremities are often produced, and these have been perpetuated by mating them together. The breed so produced is absurdly called the Himalayan variety, and, as it reproduces its like, is as pure and distinct a breed as any other that can be named. But, in the strictest scientific sense of the word, no particular variety of rabbit can be said to be a pure breed, as, like all the others, it is descended from the wild original. In the same manner we may deny the applicability of the term pure breed to the varieties of any domesticated animal; even if, as in the case of the dog or sheep, we do not know the original from which they descended.

"All that can be asserted of the so-called purest bred variety is that it has

*Miles' Stock Breeding, pp. 198-204.

been reared for a number of years or generations without a cross with any other variety. But it should be remembered that every variety has been reared by careful artificial selection, either from the original stock or from other varieties.

"In the strict sense of the word, then, there is no such thing as an absolutely pure breed—the term is only comparatively true. We may term the Spanish fowl a pure breed, because it has existed a long period, and obviously could not be improved by crossing with any other known variety; in fact, its origin as a variety is not known. But many of our domesticated birds have a much more recent origin. Where were the Game Bantams fifty years ago? The variety did not exist. They have been made by two modes, breeding Games closely in-and-in to reduce the size, and then crossing the small Game fowl so attained with Bantams. Nevertheless, Game Bantams, as at present shown, have quite as good a claim to the title of a pure breed as any other variety. In fact, every variety may be called a pure breed that reproduces its own likeness true to form and color.

"The statement that Brahmas, Black Hamburgs, Dorkings, etc., are pure breeds is meaningless, if it is intended to imply anything more than that they will reproduce their like, which a mongrel cross between two distinct varieties cannot be depended on doing. There is no doubt but that many of our varieties have been improved by crossing with others. The cross of the bull-dog, thrown in and bred out again is said to have given stamina to the grey-hound, and, although generally denied, there is no doubt but that the Cochin has in many cases been employed to give size to the Dorking. In the same manner new permanent varieties of pigeons are often produced, generally coming to us from Germany, in which country the pigeon fanciers are much more experimental than in England, where they adhere to the old breeds with a true John Bull, or bull-dog like tenacity."



CHAPTER IX.

THE ASIATIC BREEDS.

The Asiatic breeds of fowls follow two distinct types, of which the docile, short-legged, loose-feathered Cochin represents one, and the erect, fierce, close-feathered Malay and Indian Game show the other. Of these types the Cochin has been most popular in England and America, and to it is due a large part of the improvement which has taken place in the poultry of these countries during the past three decades.

It would seem, from the statements of travelers in China, that our various Chinese breeds are simply the common barn-yard fowls of that country, where they are allowed to breed indiscriminately, all colors running together, and that the various names by which we know them here are simply those of the port from which the importation was made, or supposed to be made, of fowls in which a certain characteristic happened to predominate; these characteristics being subsequently fixed by a skillful selection among western fanciers. This has certainly been the case with many of these breeds, as it is well known that when first imported they came in mixed lots, and that it required years of careful breeding in this country to fix the characteristics of the Brahmas and of the various Cochins.

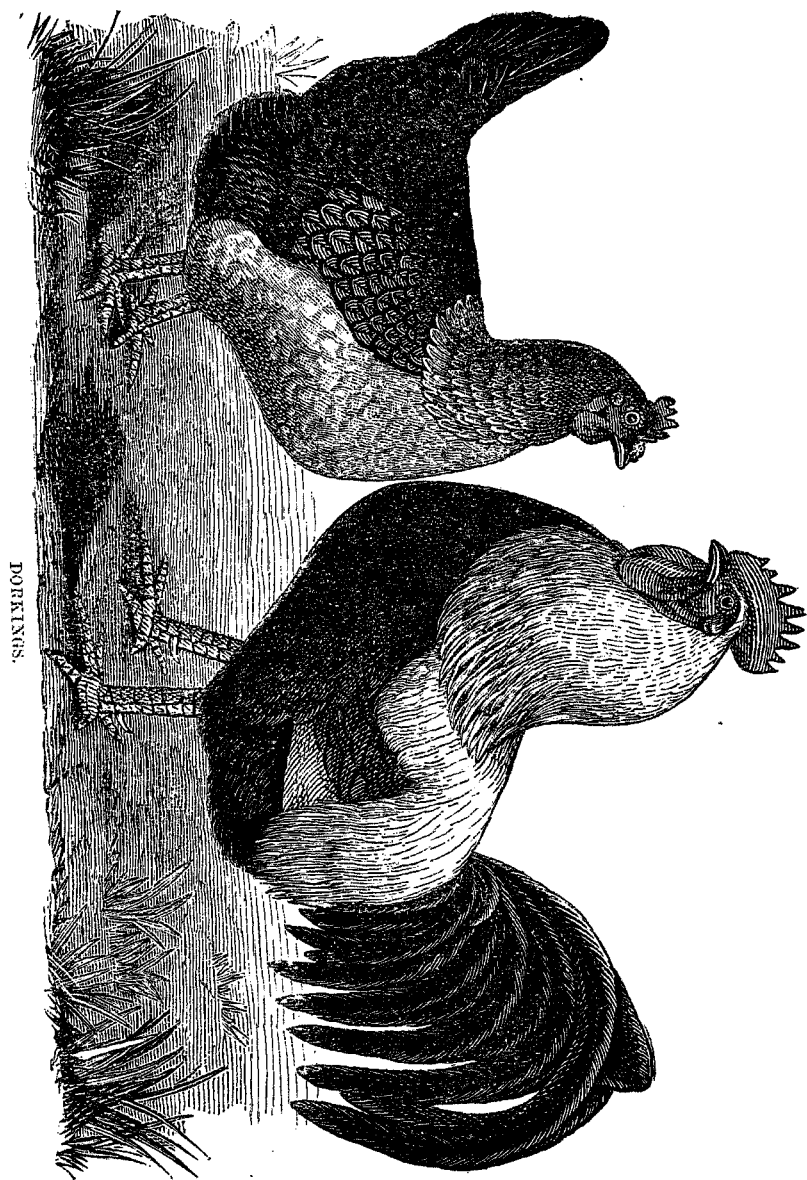
The general effect of the infusion of this eastern blood into the fowls of Europe and America has been to increase their size, hardihood, and docility; a gain which has been accompanied with a slight loss in quality of flesh and with an increased disposition to sit; these, however, are small offsets against the great improvements produced.

COCHINS, OR SHANGHÆS.

The conclusion in 1843 of the war between England and China, by which the northern ports, including Shanghai, were thrown open to European vessels, began a new era in the poultry business of the West, by the infusion of the blood of the large Chinese breeds of fowls into those of Europe and America.

Among the first fowls imported from China to England was a flock belonging to the Queen, represented in the *Illustrated London News* of December 23, 1843, and called Cochin-Chinas. These fowls, however, were very different from those known to-day as Cochins, being tall, slender and clean legged, and having more of the Game shape than of the Cochin.

With regard to the appropriateness of the name of Cochin for this breed of fowls Mr. Tegetmeier says: "As in the case of many other varieties of fowls, Cochins are known popularly by a name to which they have no claim. Mr. Robert Fortune, who has passed many years in various parts of China says:— 'The man who first gave these fowls the name of Cochin-Chinas has much to answer for. I firmly believe that what are called 'Cochin-Chinas' and 'Shanghai's'



DORKINGS.

are one and the same. One thing is certain—the breed you have in this country as Cochin-Chinas are plentiful about Shanghæ. They were discovered there after the war, and were frequently brought to this country, and taken to India by captains of trading vessels. Was not this the date of their introduction to England? And what grounds has any one for supposing the fowls ever saw Cochin-China? It may be thought that this variety might have been earlier known, owing to our long-established commerce with Macao and Canton, but Mr. Fortune says that it is a breed but little known in those warmer parts of China, and that, ‘in fact, the southern Chinese were as much struck with the size of the breed as we were.’ He adds, ‘The Shanghæ breed seems to be more common about Shanghæ than anywhere else in the north,’ but I found it over all the low country of that part of China. The southern breeds have long been well known to ship-captains and English residents, but there is nothing very marked in their character.

“Having stated the date of introduction and the place from whence they were derived, Mr. Fortune informs us as follows, respecting the characteristics and treatment of the birds as they occur at Shanghæ itself: ‘The Shanghæ breed occurs both with feathered and unfeathered legs, but more frequently unfeathered. The most admired kinds there are the game-colored ones. However, I am safe in saying that the Chinese do not attach so much importance as we do to purity of color; large size and large eggs are what they most admire and prize.’

“Although it is certain that the Shanghæ fowl is frequently met with in its native district with unfeathered legs, even more frequently than with feathered or booted legs, nevertheless, in our country, fashion has decided most imperatively in favor of the feather-legged birds, to which alone prizes are now awarded at our poultry shows.

“In accordance with the facts that these birds were imported from Shanghæ, and were comparatively unknown in Cochin-China, it has been thought by some writers desirable to endeavor to correct the popular but erroneous name of Cochins, and to substitute that of the port from whence they were originally obtained; but the effort has not been crowned with success, and to the large majority of poultry breeders they are known only as Cochins. In the United States both names are employed; those birds that are feather-legged being termed Shanghæes, while the clean-legged specimens are known as Cochins.”

The Cochins are divided into several sub-varieties, according to color and size. The general characteristics applicable to the whole breed, are given by Mr. Wright as follows:

“The cock ought not to weigh less than ten or eleven pounds, and a very fine one will reach thirteen; the hens from eight to nine or ten pounds. The larger the better, if form and general make be good.

“The breast in both sexes should be as broad and full as possible, the general want of breast being the greatest defect in this breed. The neck can hardly be too short in either sex, so that it does not look clumsy; and the hack must be short from head to tail, and very broad. The legs should be short and set widely apart, and the general make as full, wide and deep as possible.

“The shanks are profusely feathered down to the toes, and the thighs should

be plentifully furnished with the fine, downy feathers denominated 'fluff.' The quality of this fluff, and of the feathering generally, is often a pretty good indication of the breed; if fine and downy the birds are probably well bred; but if rank and coarse they will not be worth attention as fancy birds. There is a tendency in the cocks to scanty furnishing on the thighs; but the breeder should choose a bird with as much fluff as he can get, not, however, allowing vulture hocks, which often accompany the heaviest feathered birds, but which are now disqualified at all first-class shows. The color of the shanks is yellow, a tinge of red being rather a recommendation than otherwise; but green or white legs are to be avoided.

"The head should be neat and rather small; the comb of moderate size, straight, erect, and evenly serrated; a notched or twisted comb is a great blemish. The ear lobes must be pure red, no white being allowed. The eye ought in color to approach that of the plumage, and should appear bright and sprightly.

"The tail of the hen is very small, and nearly covered by the feathers of the saddle, which are very plentiful, and form a softly rising cushion on the posterior part of the back; the tail of the cock is larger than that of the hen, but still small, and must not be very erect, nor contain much quill; the wings in both sexes are very small, neatly and closely folded in, and the general carriage is noble and majestic."

With regard to the merits of this breed of fowls Mr. Tegetmeier says: "The strongest point in the value of Cochins as profitable fowls is their high excellence as winter layers. As to supplying chickens for sale in any first-class markets they hold a very inferior position in the scale of merit. They have in fact, many drawbacks to their value; instead of the small bone of the Dorking, they possess coarse, spongy bones of large size, and of a much greater weight. It is evident that all the food which has been required to form the extra quantity of bone, in a profitable point of view has been uselessly employed.

"The yellowness of the skin and fat is a serious drawback to the saleable value of Cochins, yellow-skinned fowls not being appreciated in the markets. Again, they accumulate large quantities of fat internally, where it is useless; but on the breast they scarcely fatten at all. From their terrestrial habits, the pectoral muscles are very slightly developed; consequently there is less meat on the breast than might be expected from the size; hence, when dressed, the keel of the bone is prominent, and requires, like that of a turkey, to be broken down. It is frequently remarked that the Cochins make up in size of leg what is wanting on the breast. This is true; but it is no recommendation to a table-fowl to develop largely the inferior portions at the expense of the finer parts. In the improved breeds of cattle the best joints are developed, and the inferior lessened in size; there is small bone, and very little offal. The same peculiarities should distinguish a table-fowl; it should be as nearly as possible all breast, with short limbs and thin bones.

"It should be recollected, that unless a fowl has naturally a full chest, it is impossible to put flesh or muscle on it by fattening; for there is this distinction between the flesh of quadrupeds and that of birds, that in the former the flesh can

be increased in size by the intermixture of fat between the fibres, which gives rise to the marbled appearance seen in prime beef. This, however, cannot be done in the case of birds, their muscles being always destitute of fat, which is deposited under the skin, or in the interior of the body only.

"The great value of Cochins as furnishing poultry for home consumption, is not to be denied. They grow rapidly when chickens; they are so exceedingly hardy that they can be reared at all seasons, and in winter with a lack of accommodation under which Dorkings would perish. Broody Cochin hens are always to be obtained; and eggs for sitting are not wanting, even in the coldest weather. Their flesh, though inferior in shortness to that of the Dorking, and of a more game-like flavor, is juicy to a high degree. For family use they are hardly to be surpassed, although as furnishing first-class fowls for the markets they are valueless. It is frequently said by their partisans that the pullets are at least equal to those of other fowls (a tacit acknowledgement that their cockerels are unequal); but it must be borne in mind that there is a tendency in Cochins to produce an extraordinary number of cocks in nearly every brood. Another recommendation they sometimes receive is that the feathers are nearly or quite as valuable as those of the duck and goose. If old birds are killed, or chickens after they have perfectly completed their autumnal moult, and become full-plumaged birds, this statement may have some weight; but at this period of their lives they are valueless, or nearly so, as market fowls; and if killed at the age when they are in the highest condition, it will be found that the feathers are mixed with *stubs*, containing so much blood, that their value is very small; whereas, in a duckling of from eight to ten weeks, the feathers of the breast are perfectly formed, and consequently valuable.

"To sum up, it may be said that the Cochins are chiefly valuable as a family fowl from their hardihood; from the ease with which they can be kept in a small space, and the manner in which they bear confinement; from their great prolificacy, in winter especially; from their docility, and the readiness with which they sit in any place, and at any time of year; and from the quickness of their growth, and large size; but as a first-class market and table fowl, it will be found that any attempt to breed them for this purpose will terminate in disappointment.

"When Cochins were first introduced, many persons turned cocks of this breed into their poultry-yards with a view to the improvement of the ordinary farm-yard stock. Never was there a more fallacious idea; fowls that are bred between Cochins and the common barn-door breeds are about the least useful variety of poultry that can be imagined; gaunt, weedy, stilty, big-boned, angular, yellow-legged birds are the produce of such a cross; and it is only requisite to ask the opinion of the poultry salesmen at Leadenhall, and of the higglers who collect the fowls for them from the country, to know the estimation in which such birds are held."

The original "Cochin Chinas" of England, or "Shanghæs" of America, probably more nearly resembled the Partridge Cochins of to-day than any other of the sub-varieties into which the breed has been split up. Being so much larger than any breed of fowls which had previously been known to civilization, as well as so different in habit and disposition, it is not surprising that they were

much sought after; and for a time the "hen fever" threatened to assume the dimensions of the tulipomania of the seventeenth century; a hundred guineas according to Mr. Wright, being frequently paid for a single cock, and not being at all an uncommon price for a pair of really fine birds.

Among the earliest offshoots of this variety were the Buff and White Cochins, and these were followed by several others, formed by selection and fresh importations from China, until now there are quite a number of sub-varieties, of which the principal are as follows:

Partridge Cochins (See illustration, page 27), in which "the cocks should have bright-red hackles and saddles, with a well-defined black stripe down the middle of each feather; the back and wing bow of a dark, rich red, with a wide, lustrous, greenish-black bar across the wings. The quills should be rich bay on the outer ends, the secondaries ending in black tips. The tail should be glossy black; not unfrequently, however, some white appears at the base of the feathers; this is always to be regarded as objectionable when found in a show pen, although not a positive disqualification to prize-taking. Fashion demands imperatively a black breast on a Partridge Cochin cock, mottle-breasted birds being disqualified, according to the Poultry club "standard of excellence," in exhibition birds. The Partridge Cochins originally imported had brown breasts, resembling those of brown-red game cocks, and the hens much more closely resembled brown-red than black-red hens. The judges, however, demanded black breasts in the cocks; consequently, such birds were bred by crossing a partridge-feathered cock with a pure black Cochin. Nevertheless a reversion to the more natural color occasionally takes place, and some of the best partridge cocks show the brown feather not unfrequently.

"In the Partridge hens the neck hackle feathers should be bright gold, each having a broad, black stripe down the centre. The remainder of the plumage should be light brown, well and distinctly penciled with dark brown. It is an important point that the penciling should be well marked on the upper part of the breast. The shafts of the feathers should be creamy white, contrasting pleasingly with the darker color of the webs of the feathers."*

The *Grouse Cochins* are a sub-variety of the Partridge Cochins, in which the hens have a darker ground color, with feather-shafts which offer no contrast to the other parts of the feathers.

The *Pea-combed Partridge Cochins* are a sub-variety originated in 1871, by Mr. Charles F. Edmonds, of Melrose, Massachusetts, and are distinguished by having pea combs instead of the ordinary comb. The following account of their origin is given by a correspondent of the *Poultry World*, in January 1874:

"At the establishment of Mr. Charles F. Edmonds, in Melrose, I saw a fine flock of superior Partridge Cochins, which struck me as being among the very best lots of this popular variety that I had ever seen. Upon a closer examination of Mr. Edmonds' fowls I discovered that all of them, old and young, were pea-combed.

"I had never seen elsewhere, any of this variety of Partridge Cochins, and I expressed surprise at the fact, when Mr. Edmonds informed me that three years

*Tegetmeier.



NOMENCLATURE.

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|---------------------|-------------------------------------|
| 1. Comb. | 12. Main Tail-Feathers. |
| 2. Face. | 13. Wing-Bow. |
| 3. Wattles. | 14. Wing-Coverts, Forming Wing-Bar. |
| 4. Ear-Lobes. | 15. Secondaries. |
| 5. Hackle. | 16. Primaries, or Flight-Feathers. |
| 6. Breast. | 17. Point of Breast-Bone. |
| 7. Back. | 18. Thighs. |
| 8. Saddle. | 19. Hocks. |
| 9. Saddle-Feathers. | 20. Shanks, or Legs. |
| 10. Sickles. | 21. Spur. |
| 11. Tail-Coverts. | 22. Toes, or Claws. |

ago he obtained a cockerel and three pullets of the Partridge Cochins from a Pennsylvania dealer, his four chickens being the first remove from a trio imported from England in 1869. His original quartette were very fine specimens; even in color; large sized, and well formed; but the cockerel and two of the pullets showed pea-combs. He disposed of the third pullet, and in 1871 bred the other three together. They proved wonderful layers, and he raised a handsome brood that season. These he culled (some of the cocks being out of shape, to his eye), and in 1872, from them, he raised two or three other broods, the majority of which were male birds.

"This year (1873), again selecting the best specimens, which continued to come with perfect pea-combs, he bred those he now has on hand, and a nicer flock of thirty to forty Partridge Cochins I never saw together."

This variety has been recognized in the "American Standard of Excellence" since 1876.

The *Buff Cochins* were probably the earliest distinct offshoot from the heterogeneous stock of the first importations. They are of several shades of color, varying "from rich, deep buff to pale lemon; all shades are admirable as exhibition birds, but it is imperatively necessary that they should match in the show-pen. The variety termed *Silver Buffs* have a very pale, light silvery tint, almost approaching to that of the breed known as *Silver Cinnamons*, but wanting the well-defined color of the hackle and tail of that variety.

"The *Cinnamon Cochins*, which are now always classed with the *Buffs* at the poultry shows, are characterized by the rich, dark, reddish cinnamon color of the hackle and saddle feathers of the cock, the colors extending over the back and wings. The tail should be a rich, bronzy black, the side feathers edged with cinnamon, and the breast, thighs and fluff the color of wetted or dark cinnamon. In the hens the same wet-cinnamon color prevails throughout the entire plumage.

"The *Silver Cinnamons*, if well marked, constitute an exceedingly beautiful variety. In the cocks the hackle and saddle and tail feathers are cinnamon, varying from a light to a rich, bright tint, and slightly striped with white; the thighs, breast, and fluff being a pale buff. In the hens the hackle is of a deep cinnamon, and the rest of the plumage of a very pale buff, which in many specimens is so light as to appear almost creamy white. The contrast of the light body with the dark hackle is exceedingly pleasing.

"*Black Cochins* were largely exhibited some few years since, but seem almost to have disappeared from our poultry shows. They should possess all the characteristics of the other varieties as to form and size, and the plumage should be perfectly black throughout; but most of the birds formerly shown were coppery red or brassy on the hackle and wings; consequently, this variety did not find any great favor with amateurs, especially since they frequently did not breed true to color." *

Of late years this breed has been taken up by American breeders, who have largely succeeded in eliminating the objectionable brassy feathers.

White Cochins (See illustration, page 39) were an early, and for a time, very popular offshoot of the original stock. They "must be perfectly pure in every

* Tegetmeier.

feather; and green legs, which are apt to occur in this color, will disqualify any pen, however meritorious otherwise." * This breed has suffered a wane of popularity, owing largely, no doubt, to the fact that its appearance suffers very much from mud or dust. When kept on a clean lawn the White Cochins presents a beautiful appearance. Mr. Hewitt is quoted by Tegetmeier as saying "the best layers of Cochins I ever met with were white."

"*Cuckoo Cochins* are occasionally exhibited; they are of a grey color, each feather with transverse markings resembling those on the breast of the bird from which they derive their name. They are inferior in character to the other varieties, and are not likely to come into general estimation.

"The singular variety known as *Silky Cochins*, or sometimes as Emu fowls, is simply an accidental variation of plumage which occasionally occurs, and which may be perpetuated by careful breeding. The cause of the coarse, fluffy appearance of these remarkable fowls is to be discovered in the fact that the barbs of the feathers, instead of being held together by a series of hooked barbules (so as to constitute a plane surface, as occurs in all ordinary feathers), are perfectly distinct; and this occasions the loose, fibrous, silky appearance from which the fowl obtains its name.

"*Silky Cochins* are usually inferior in size to the ordinary varieties; they are good layers and sitters, not differing in these respects from the other specimens of the breed from which they have evidently been derived." †

"*Blue Cochins*, *Dominique Cochins*, and *Spangled Cochins*, are what may be termed apocryphal breeds, in distinction to the canonical ones; that is, those recognized by the *Standard*. They are cultivated by a few individuals with a zeal and persistence worthy of a good cause, though their efforts are looked upon by fanciers generally with a distrust that ripens into hostility whenever attempts are made to procure recognition of the new breeds in the above work. In the case of the Pea-combed Partridge Cochins, lately admitted to 'good and regular standing' in the *Standard*, there was much opposition among the conservatives, though the progressionists triumphed." ‡

BRAHMAS.

About no question belonging to poultry has there been so much dispute and wrangling as about the origin of the Brahma fowls. One party, Mr. George P. Burnham, of Melrose, Massachusetts, claims to have produced the Light Brahma by crossing a Chinese or Shanghai fowl, called by him the Gray Chittagong, upon a Buff Cochins hen, thus making a cross between two Chinese breeds. This cross Mr. Burnham called Gray Shanghai, and under that name sent a cage of the birds to Queen Victoria, in the fall of 1852, as an advertisement. The fowls thus sent to England were undoubtedly closely connected to the strain called today "Light Brahmas," as shown by Harrison Weir's excellent illustration, given in the "*Illustrated London News*" early in 1853.

Mr. Burnham's claim of originating this breed was, however, hotly disputed by other parties, and especially by Nelson H. Chamberlain, of Hartford, Connecticut, who claims to have bred these fowls as early as 1848, from a pair imported from China or India, and that it was from the progeny of this pair that the fowls

* Wright. † Tegetmeier. ‡ Poultry World, Vol 4, p 259.

were selected which were sent to England as "Gray Shanghæes." Mr. Chamberlain's claim is supported by the following statement by Charles Knox, Esq., lately resident of Toledo, Ohio, but at that time of Hartford, Connecticut:

"Early in the fall of 1847, while I was clerk on the propeller 'Sachem,' of the Hartford and New York line, Captain George Deming, master, on invitation of a friend I went on board a full-rigged East-Indiaman, lying near Old Slip, East River, to look at a remarkable collection of poultry which we had heard about. I never knew or thought to ask what port the vessel sailed from, nor her name, for that class all bore the same name in common conversation—'East-Indiamen.' Among the poultry I saw two pairs, one gray, the other red, which attracted a great deal of attention on account of their large size. After some trouble I learned that they were to be exhibited at Franklin Market. The next trip, after reporting to Mr. Chamberlain (who had some time previous requested me to keep a lookout for something of this description, and wished to get some new breed) at his request, on my return to New York, I went and bought the gray pair, and took them to Hartford." Mr. Knox states further that these gray fowls very closely resembled the Light Brahmas of to-day.

It seems a little singular that if these birds were actually brought from India there should never have been a second importation of the same stock, and that those who have so hotly contended for the honor of originating or first introducing the breed have not been able to prove to us whether it is actually found on the banks of the Burrampooter, (or *Brahma-putra*), or in some more secluded spot. Considering how long the ports of India, and many of those of China, have been open to western commerce, if there were such a striking breed of fowls in existence in any of those lands, we should have had some record of it from disinterested parties. Upon this point Mr. Tegetmeier says:

"There is not a particle of evidence to show that they (the Brahmas) came from India. The banks of the Brahmapootra have long been in possession of the British—at least the lower part of the course of the river—and no such fowls were ever seen in the locality.

"In fact, Brahmas originated not in India but in America; and the two varieties of the breed now known as light and dark Brahmas, had unquestionably very distinct origins. The Light Brahmas undoubtedly originated in, or were identical with, those gray birds that from the very first importation came over from Shanghæ with the buff and partridge birds now universally known as Cochins."

Mr. Knox's word is unimpeachable, however, and we suspect that the breed was simultaneously originated in two different strains, afterward amalgamated—as is claimed by some parties to the controversy, and as is indicated by the fact that Mr. Burnham's "Gray Shanghæes" had single combs, instead of pea-combs. Whatever may have been the origin of the Brahmas, however, there are few fowls which to-day breed more true to their characteristic color and markings, and can be depended upon more implicitly to perpetuate their qualities of habit and disposition. Like most of the Chinese breeds, they are very quiet and docile. They are easily confined, as they have but little ability to fly, and a fence three feet high will turn them. As layers they are excellent, beginning, under favorable circumstances, when five or six months old, and laying from thirty to

forty eggs before beginning to sit. They make excellent mothers, except that, owing to their weight they are somewhat liable to break their eggs. The chicks are among the hardiest of the Asiatic breeds, easily managed, rapid growers and healthy. They are a little late in fledging, but not so much so as the Cochins. When allowed to run they are good foragers, but they bear confinement remarkably well, and there is perhaps no breed of fowls better suited to the wants of villagers who must keep their poultry confined on a small range. In fact, any occupier of a village or city lot might keep a few of these fowls, as their docility and inability to fly render them so easily managed that they can readily be prevented from trespassing upon their owner's or his neighbor's garden. As table fowls the Brahmas are excellent, their flesh being white, tender and juicy, and they lay on flesh very rapidly when put up to fatten.

The Brahmas are the largest known varieties of chickens: single cocks have reached the weight of sixteen to seventeen pounds, although twelve to thirteen pounds for cocks, and nine to ten pounds for hens are considered good weights. Next to its size, the most marked peculiarity of the Brahma fowl is its comb, which should be what is called a pea-comb, that is, one having the appearance of three small combs joined together, the largest being in the middle, and all finely serrated. The comb as a whole is rather small, and perfectly upright. The only difference between the combs of the two sexes is that of size. Single combs are occasionally found, but are considered objectionable, and a single-combed Brahma would have no chance in the show-pen if in competition with a triple-combed one that was reasonably good in other respects. The comb being twisted, or falling over to one side, is considered a disqualification in the show-pen.

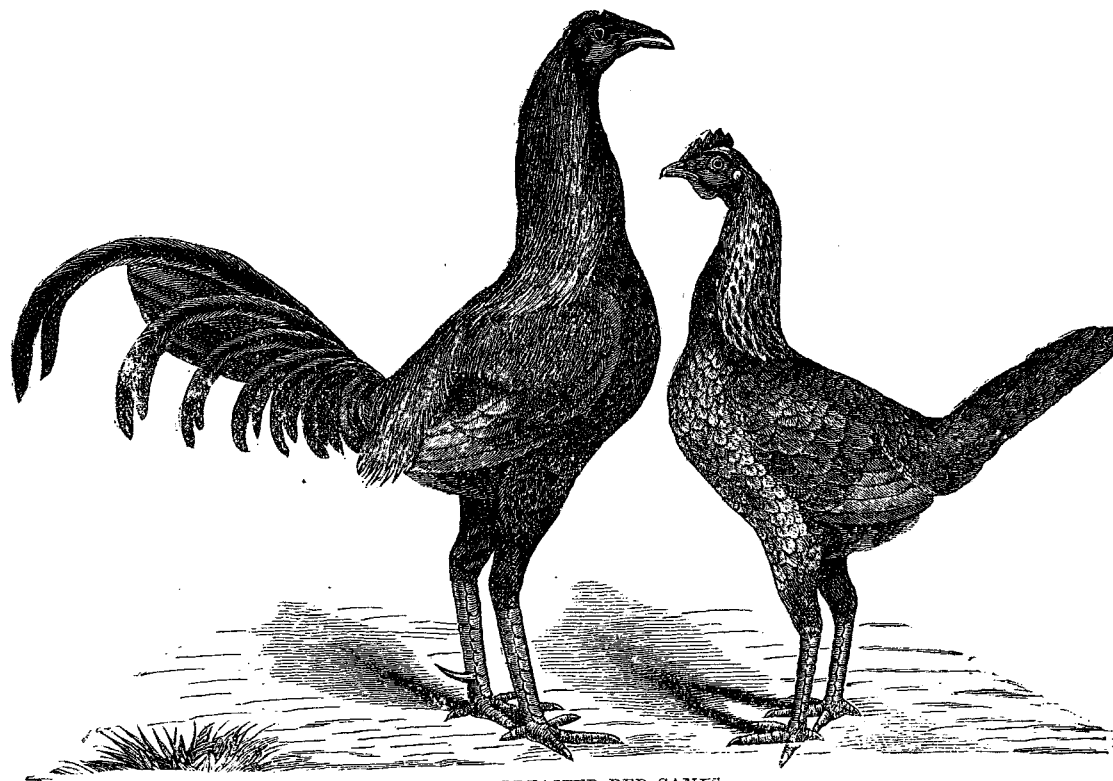
The head should be moderate in size, as compared to the rest of the body. The ear lobes are large and pendant; the wattles comparatively small and well rounded. The form of the body corresponds with the size. The breast is full and prominent; the back short and broad; the neck tapering neatly from the head to the body, and of good length; the neck-hackle feathers flowing well over the shoulders. The wings should be small, and the tips well covered by the saddle feathers. The tail should be quite small, but carried erect, and nearly covered by the tail coverts.

The fluff should be exceedingly abundant in both cock and hen, and covering the thighs and hinder parts of the body in such a way as to give them a very broad appearance when viewed from behind.

The thighs are large and muscular, and well covered with soft feathers, which should cover the joint, but should not form the wing-like appendages called vulture-hocks, which are considered an absolute disqualification in the show-pen to the Light Brahma, and decidedly objectionable in the dark variety. The shanks should be rather short, stout, and abundantly feathered down to the outside of the outer and middle toes.

The above characteristics apply equally to the original or "Light" Brahma, and to the more recently established variety—the Dark or Pencilled Brahma. In color, however, these breeds differ materially.

The *Light Brahma* should be clear white in color on the body, breast and thighs. The neck-hackle should be marked with a distinct black stripe down the middle of each feather, and should not be light or cloudy. The hackle of the



BLACK-BREASTED RED GAMES.

cock, however, should be a little lighter than that of the hen, as there is a slight tendency to breed too dark. The saddle feathers in the cock are white, or lightly striped with black, those of the hen being white.

The flight feathers of the wing are black, but when folded they are so hidden as to appear white.

The tail feathers are black in both cock and hen, and in the cock they open out laterally, like a fan, and the coverts show beautiful green reflections in the light.

There are few prettier sights in the poultry-yard than a flock of Light Brahmas feeding upon a green lawn, their snow-white plumage picked out with black, and contrasted with the bright red of their ear lobes and wattles. (See illustration, page 53.)

In the *Dark Brahma*, while the peculiarities of form, disposition, etc., closely resemble those of the Light, the coloring of the feathers is entirely different. The upper part of the body of the Dark Brahma cock, including the neck-hackle, back and saddle, is silvery white, striped with black; the breast, thighs and under part of the body are pure black, or but slightly mottled with white; the feathers that cover the base of the quill feathers of the wing are of a metallic green-black, and form a broad, well marked bar across the wings; the flight feathers of the wings are white on the outer and black on the inner webs; the secondary quills, which are visible when the wing is closed, have a broad, dark, green-black spot at the end of each feather; the tail is black, the coverts on each side being of a beautiful, lustrous green-black, the smaller feathers being edged with white. The shanks should be of a yellow color, and they should be well clothed with dark feathers slightly mottled with white.

In the hen the color of the head is gray, the neck-hackle silvery white, striped with black. The remainder of the plumage should be dull white, but so minutely pencilled throughout with dark pencilling as to give the hen a gray color. This variety, like the Light Brahma, breeds remarkably true to color, but any admixture between them will produce birds of uncertain plumage, having sandy colored patches on the backs and wings, and splashes of white or black on the breasts. Even when the pullets from such a cross breed tolerably true to color the first year, they are nearly sure to moult much worse in color the second year. (See illustration, page 63.)

LANGSHANS.

This breed of fowls was discovered in or near the year 1872, by a nephew of Major Croad, of the British army, who was traveling in the interior of China for scientific purposes. The fowls were discovered in the Chinese district of Langshan, hence their name.

They bear considerable resemblance to the Black Cochins; differing in having dark colored, instead of yellow legs; in being of more erect habit, resembling the Brahmas in this respect; in possessing a better quality of flesh, being white and fine grained; and in being less disposed to sit.

The plumage of the Langshans is wholly of an iridescent black color; the fowls are of large size, the cocks weighing ten pounds and the hens eight pounds or over when well grown. The hens are said to be among the very best of layers.

As will be seen from our illustration, the Langshans have larger tails than the Cochins, they are also distinguished by showing a pinkish tinge between the toes.

Owing to their great popularity, and the ease with which the deception could be practiced, the Langshans have been largely crossed upon the Black Cochins, and the produce sold as pure Langshans. This breed is not yet recognized in the *American Standard*. (See illustration, page 75.)

MALAYS.

This breed of fowls has never become popular in America, nor to any great extent in England, where they made their appearance a few years previous to the introduction of the Cochins.

In appearance and disposition the Malays bear more resemblance to the Games than to the Cochins; although in stature they far exceed the Games, the cocks weighing from nine to eleven and a half pounds, and standing, when full grown, from two feet nine inches to three feet high, and the hens weighing from seven and a half to ten pounds.

The date of the first introduction of the Malays into England is not known; but they were frequently brought home by the stewards of English vessels trading to and from India, and sold to dealers in the neighborhood of the docks in the east of London. The colors of these imported birds were not uniform, but by selection English breeders produced several distinctly marked varieties. The breed is thus described by Tegetmeier:

"In carriage and form Malays are strikingly distinguished from all other varieties of domestic poultry. The cocks are exceeding long in the neck and legs; their carriage is particularly upright, the back being almost always at an angle of forty-five degrees, except when they are eating; the wings are carried very high, and firmly closed. Malays are very bulky across the shoulders, and from the closeness of the plumage, the fore part of the wing stands away from the body, as it does in the carrier pigeon. The body narrows very rapidly indeed toward the tail, which is very small, and droops in the cock so as to form nearly a straight line with the back. The thighs are long, strong, and well developed. The longer and stronger the legs the better, if length be combined with an easy gait in walking. The head is carried very high, and, from the short and very scanty nature of the hackle feathers, the neck looks much longer than in any other variety of fowl. The form and carriage of the hen are generally similar to those of the cock; but from the hackles being still shorter the extreme prominence of the wings is even more visible.

"The plumage in Malays is short and close, but extremely brilliant and glossy. Every feather is peculiarly narrow, and possesses far less down towards the root than do the feathers of any other known variety; and, consequently, should the bird be taken in hand, it always proves more weighty than is anticipated. The extraordinary lustre of the entire plumage in well-bred and high-conditioned birds is remarkable.

"The head in the Malay is long and snaky, the brow projecting over the eye so as to give a peculiarly hard expression to the face. The eyes should be bright, fiery red, as according best with the vindictive expression of the face; but pearl

eyes are found in good specimens. The beak is very strong and hooked. The comb is very small, low, and flat, and is attached closely to the head, without any tendency to fall over to either side. It should be covered over with small, warty prominences, and end abruptly over the eye, not projecting in a peak.

"Malays are remarkably characterized by the very slight development of wattles and ear-lobes; but the skin of the face and upper part of the throat is red, and from the scanty nature of the plumage, this redness becomes a marked feature of the breed. The countenance has been justly described as very skinny.

"In color Malays vary considerably. The varieties exhibited generally partake of the color of black and brown breasted red Game. In these the hackle and saddle in the cock should be dark, glossy red; the breast black, or black slightly mottled with brown. The back and shoulder coverts are deep, rich maroon; the bar across the wings wide and well marked with a bright metallic or purplish green-black tint.

"The flight feathers, or quills, should be dark red, and the tail feathers small; others black, and glossy to an extreme degree, being resplendent with purple and green metallic reflections, as the light plays upon them in the movements of the bird.

"The legs in both sexes should be characterized by strength and size; in color they should be brilliant yellow, and without a vestige of feathers appearing on the sides.

"The general plumage of the hens in this variety is reddish brown, verging into that of wetted cinnamon in the darker breeds.

"In the *Pile Malays*, now seldom seen, the hackles in the cock are red and white, the breasts white or mottled, and the general plumage of the hens white, mottled with chestnut red.

"The plumage of the *White Malays* is soon described. The face, comb, and naked skin of the throat should be bright red, the feet and legs bright yellow, and the feathers purely white."

The Malays bear the reputation of being the most savage in disposition of all varieties of fowls, even literally tearing their opponents to pieces; they are further especially subject to the disagreeable habit of feather eating. They are very hardy in constitution, and on this account, as well as on account of their superior size, they have been used in certain crosses where it was desired to infuse greater size and vigor into a degenerating breed, and upon this fact, chiefly, depends their interest to American fanciers. According to some authorities the old "Chittagong" fowl of the United States was a large variety of Malay, and Malays are thought to be the parent stock of the breeds known as Black Java, St. Jago, India, Bucks County, and Ostrich fowls.

BLACK JAVAS.

This breed is chiefly of interest from its supposed connection with the origin of the Plymouth Rocks. In the *Poultry World* for September, 1879, appears the following letter with regard to it:

"H. H. STODDARD, *Sir*:—This fowl was exhibited in January, 1879, at the show

of the American Poultry Association at Buffalo, and at their meeting a petition to admit it to the *Standard* was referred to a committee, to investigate and report. This is the entering wedge for the introduction to poultry breeders of a very rare and beautiful fowl, which was once quite well known in New York state. At the meeting of the New York State Agricultural Society, held in the fall of 1845, the late Mr. Luther Tucker exhibited this fowl. Here is the language of the committee's report on it:

"Mr. Tucker introduced to our acquaintance a tall and loving couple from Java, under the application of *Black Javas*, and another couple that were *White Javas*. They may safely be called giants of the roost, and were propagated by the children of Anak, in the early days of the world, for the *Polands* and *Bantams* of these degenerate times can no more be compared to them than *Hyperion* to a *Satyr*." (Vol. V., N. Y. S. A. S. Reports, page 94.)

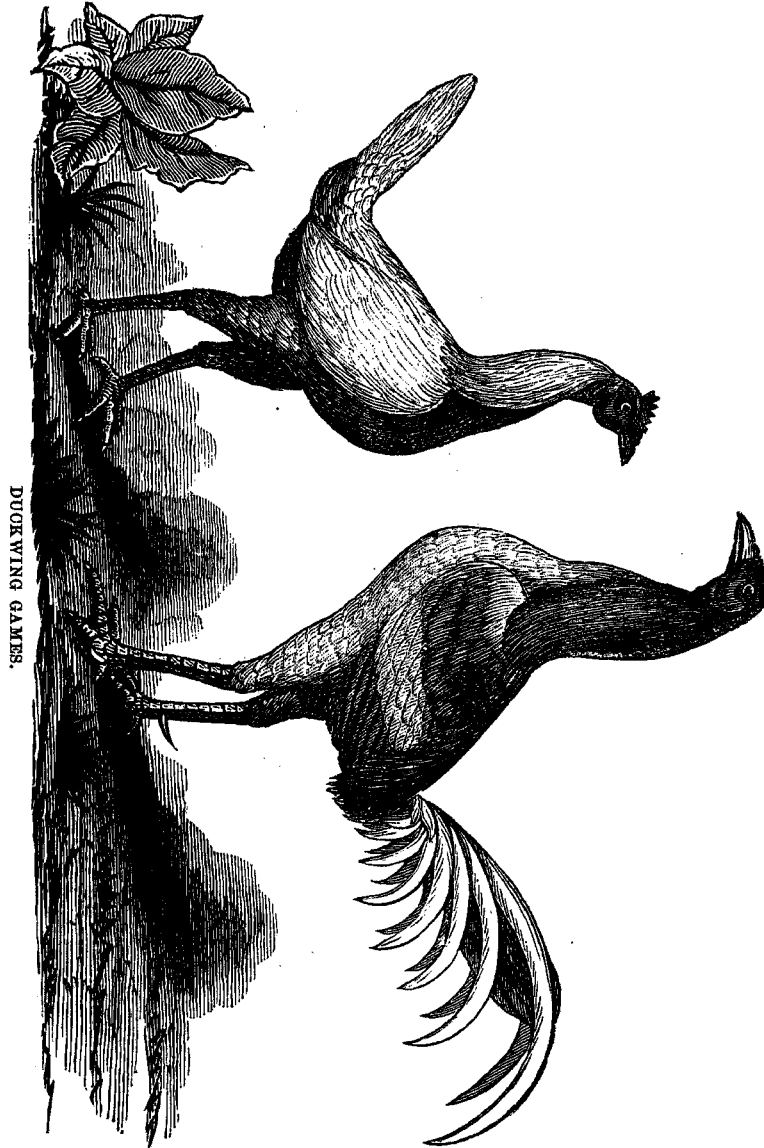
"Dr. Bennett, in his treatise on poultry, speaking of the *Black Javas*, says: "These, like all other pure Java fowls, are of a black or auburn color, with very black legs, single combs and wattles. They are good layers, and their eggs are very large and well flavored. Their gait is slow and majestic. They are, in fact, among the most valuable fowls in the country, and are frequently described in the books as "*Spanish fowls*," than which nothing is more erroneous. They are as distinct and original a breed as the pure-blooded great Malay, and possess about the same qualities as to excellence. Their plumage is decidedly rich."

"A strain of this fowl has been preserved pure to the present day, and your correspondent finds them to answer fully the most specific descriptions of years ago, when they were largely bred in New York State. They prove good layers, sitters and mothers, and in quick maturity and weight of carcass they are not excelled by any breed. Their plumage is very black—that greenish black which is so beautiful in the sunlight; and, unlike the *Asiatics*, they are graceful in motion.

"It will be observed that the report first quoted speaks of *White Javas*. It is one of the peculiarities of the fowl that from these intensely black hens and cocks a perfectly white chick may come. This fact has come under the personal observation of your correspondent."

The *Black Javas* were for a time delegated by the managers of poultry exhibitions to the *Cochin* class, a fact which caused some amalgamation between them and the *Black Cochins*, to the partial loss of their distinctive characters.

The *Javas* are not yet recognized by the American Standard of Excellence.



DUCKWING GAMES.

CHAPTER X.
THE ENGLISH BREEDS.

DORKINGS.

Columella, who wrote upon agricultural topics from 10 to 40 A. D., described a fowl which bore many of the characteristics of the Dorking, as being the common fowl of the Romans of that day. From this fact, and from the further reason that the Dorking ranks among the oldest of the English breeds of fowls, it is quite generally supposed that it was introduced by Cæsar.

The probability is that the breed has been greatly modified and improved in more recent times, however, and that it may properly be considered a composite breed, perfected during a long series of years, by breeders whose aim has been to produce a first-class table fowl by breeding from any bird whose size or form promised an improvement on the original stock.

As now known the Dorkings are divided into several sub-varieties, the principal of which are the Gray, or Colored; the Silver-Gray, and the White. Of these the *Gray Dorkings* are the largest, the cocks weighing ten to twelve or even fourteen pounds; the hens eight and a half pounds or over. "The body in both sexes should be large, deep and plump, and in the cock the breast should be so prominent as to form a right angle with the lower line of the body, when viewed from the side; the back and breast should be very broad; the legs should be white and free from feathers, and spurred only on the inside—not, as is sometimes the case, on the outside; the feet must be five-toed, and the extra toe should be well separated from the others, and turned upward. The head should be proportionate to the size of the bird; the wattles well developed. The comb in the Dorkings varies considerably; it may be either single or rose. Single-combed cocks should have the comb erect and free from side sprigs; but there is a great tendency in many good birds to have the combs lopping over to one side. In the rose-combed birds the comb should be square in front, and ending in a raised peak behind, without any depression in the centre. The appearance of the Dorking cock is greatly improved by his possessing a large well formed tail, which should not droop, but be carried well over the back. In the classes for Colored Dorkings at the poultry shows the exact marking as to color is not regarded as a matter of moment, provided always the birds match in the pen. But of late years the breed known as Silver-Grays have come into high estimation, as they conjoin many of the good qualities of the colored breed with the beauty of plumage possessed by those birds that are regarded more especially as ornamental poultry. In this latter variety the color of the plumage is very important, as a single white feather in the breast or tail of the cock is held as a disqualification in the show-pen. It is necessary, therefore, to

give the characteristics of this breed as distinct from the ordinary colored or gray birds. (See illustration, page 88.)

"In size, the *Silver-Gray Dorkings* rarely equal the colored breeds. The form of the body, however, should be identically the same; and a like remark also applies to the comb, wattles, feet, etc.

"The distinguishing colors of the *Silver-Gray Dorking* cock are: perfectly black breast, tail, and large tail coverts; the head, neck, hackle, back, saddle and wing-bow a clear, silvery white. Across the wings there should be a well marked black bar, contrasting in a very striking and beautiful manner with the white outer web of the quill feathers and the silvery white hackle and saddle.

"In the hens of this beautiful variety the breast is salmon-red, passing into gray toward the thighs. The neck is silvery white, striped with black; the back wings should also be of a silvery or slaty gray, and as free as possible from any tendency to redness. The tail should be dark gray, the inside being very nearly black." *

With regard to the special excellences of this breed of fowls Mr. Hewitt says: "There is not a doubt that Colored Dorkings are decidedly the most useful of all fowls for general table purposes; as not only is the flesh of extremely good quality, but it is produced in far greater abundance than in most varieties. Another very important point in the consideration of the Dorkings is that the greater proportion of flesh will be found on those particular parts most generally esteemed; namely, the breast, wings and merry-thoughts; hence they carve to especial advantage. They also grow rapidly, and are in good condition at almost any age, if at all freely supplied with food. As layers, many other fowls are better than Dorkings; nor do they thrive well without a good and extensive grass-run. The chicks are delicate youngsters to rear, particularly if the sub-soil is not remarkably dry and warm; this will at once account for their success on chalky soil. In consequence of their great weight they frequently, when aged, become quite lame and distorted in the feet and toes, from injuries producing corns and even abscesses; these are most difficult to cure, if of long standing; but as a preventive, low perches are absolutely essential; they should never exceed two or three feet from the ground. Dorkings degenerate most rapidly in size and character from interbreeding; and for this reason fresh blood should be frequently introduced, or the most speedy and vexatious disappointment will certainly ensue."

White Dorkings are usually smaller than the Colored, and should be of a clear, white color. There is a tendency to cream, or straw color in the back and wings of the cocks, which, while it does not amount to an absolute disqualification, is still considered a serious fault.

It will be seen from the foregoing description that the Dorking is not adapted to the wants of American poultrymen; it would seem, however, that some of its good qualities might profitably be added to some of our hardier American breeds, and it has been used to a certain extent for a similar purpose in England, the cross of the Dorking upon the Asiatic fowls possessing a greater degree of hardiness, combined with the superior table qualities of the former.

*Tegetmeier.

GAMES.

There are two distinct races of Game fowls, the English and the East-Indian; both having originally been bred for the purpose of cock-fighting, which was one of the most popular amusements in England until it was prohibited by law in the seventeenth century.

In fowls bred for such a purpose we should expect to find compactness of form, hardness of constitution, and great courage, and these qualities are eminently characteristic of the Games, and especially of the English Games, in which the practice of cock-fighting has served to forward the working of the natural laws by which the strongest and hardiest become the progenitors of the race, as the victors of the cock-pit were naturally selected for the chiefs of the breeding-yard, a "natural selection" which was protected and encouraged by the skill in breeding for which the English are justly celebrated, until this breed of fowls has come to be regarded as the highest type of gallinaceous hardihood, courage, and elegance of form.

Indeed, so great has been the care taken of the purity of the blood of certain strains of these fowls that their pedigrees have been kept after the manner of cattle and horses, so that they may be traced for a century or more.

There are many sub-varieties of the English Game, based upon size, or color of plumage, but these all have a generally recognized and uniform type of form and carriage, the characteristics of which are thus given by Tegetmeier:

"The carriage and form of the Game cock are certainly more beautiful than those of any other domestic fowl. The neck is long, strong, and gracefully curved; the hackle short and very close; the breast broad; the back short, and broad across the shoulders; the whole body very firm and hard, with a perfectly straight breast and back, the latter tapering towards the tail; the wings are large and powerful, and carried closely pressed into the sides; the thighs are strong, muscular and short, tightly clothed with feathers, and well set forward on the body, so as to be available for fighting; the shanks rather long, strong, but not coarse, covered with fine scales, and of moderate length; the feet flat and thin, the toes long and spreading, so as to give a good hold on the ground; the hind toe must be set low down, so as to rest flatly on the ground, and not merely touch with the point—a defect which is known as duck-footed, and is regarded as a serious disqualification, as it renders the bird unsteady when pushed backward by his opponent.

"The plumage is compact, hard, and mail-like to a remarkable degree, and possesses a brilliant glossiness that cannot be surpassed. The tail in the cock is rather long, the sickle feathers gracefully arched, and carried closely together, the whole tail curved backwards, and not brought forwards over the back—a defect which when present causes the bird to be termed squirrel-tailed.

"The head in this variety is extremely beautiful, being thin and long, like that of a greyhound; the beak massive at its root, strong and well curved; the eye large, very full, and brilliant in lustre; the ear-lobe and face of a bright scarlet, and the comb in undubbed birds single, erect, and thin. The spur, which is exceedingly dense and sharp, should be set low on the leg, its power as a weapon

being thereby greatly increased; it may be remarked that this offensive organ is often present in the softer sex.

"In the hen, the form, making due allowance for the difference of sex and alteration of plumage, resembles that of the cock. The head is neater, the face lean and thin. The small, thin comb should be low in front, evenly serrated, and perfectly erect. The deaf-ear and wattles should be small. The neck, from the absence of hackle feathers, looks longer and more slender than that of her mate. The tail feathers should be held closely together, and not spread out like a fan, as is not unfrequently stated. The plumage should be so close that the form of the wing should be distinctly visible, the outline not being hidden by the feathers of the body."

The *Black-breasted Reds*, perhaps, most nearly resemble the original Gamefowl. In the cocks of this variety the breast and thighs are bluish black, with glossy reflections; the tail greenish black; the hackle and saddle orange red; the shoulder coverts dark red. In the hens the general color is a rich partridge brown, with a red fawn-colored breast, and reddish-golden hackle with dark stripes. (See illustration, page 95.)

The *Brown-breasted Reds*.—The breast and thighs should be of a brown-red color, but this variety is not so uniform in color as the black-reds; the tail is a greenish black; the hackle striped with black, and the wing often crossed with a glossy green bar. The general color of the hen is very dark brown; grained or pencilled with lighter brown; her neck-hackle a dark golden copper-red, thickly striped with dark stripes; and her comb and face darker than the cocks', and his are darker than those of the black reds.

The *Ginger-Reds* differ but little from the Brown-reds except in the color of the breast, which is a ginger-red color in the cock, growing darker upon the thighs, and in the hen is yellowish brown around the throat, with a narrow margin of a lighter shade, and dusky brown lower down, with a narrow margin of a golden ginger shade.

The *Yellow Duckwings* have black breast, legs and tail in the cocks; with straw colored head, hackle and saddle; and bright copper or maroon colored back. In the hen the head is gray; neck, white, striped with black; back, bluish or slaty-gray; breast salmon-red, shading off to ashy-gray towards the thighs; tail, dark gray.

The *Silver Duckwings* cocks have silvery white heads, hackle and backs; and the hens silvery gray on the same parts, both being in other parts colored like the Yellow Duckwings. (See illustration, page 101.)

The *Red Pile* cocks have red heads, necks and backs, with white breasts, legs and tails; and the hens have chestnut-red necks and backs, breasts the same in front, shading to white below, white wings and tails.

In the *White Piles*, the neck and saddle are mainly white in the cock, but faintly pencilled; the back light-red; the tail white. In the hen the neck, back, tail and thighs are white; the breast chestnut color; the primary and secondary wing feathers white. (See illustration, page 107.)

White Games are pure white in both sexes, and should have no admixture of straw color.

Black Games are of a metallic black color in both sexes.



P. L. GAMES.

Blue Games are blue to dark blue throughout, except the wing-coverts of the cock, which are tinged with golden-red or yellow.

Gray Games have in the cocks black breasts, thighs, tails, and wings, except the wing-bows. In the hens the tails are black; the rest of the plumage in both sexes being silvery to dark gray.

Spangled Games are spangled throughout, with any well defined combination of colors, as black and white, blue and white, red and white, buff and white, etc.

Each of these varieties of Game fowls is also represented among the *Game Bantams*, which differ from the larger varieties only in size.

Henny Games, are Game fowls in which the sickle feathers of the cock's tail are wanting, thus giving him a hen-like appearance. They are of the various colors described above. Originating first as sports from the ordinary varieties, their characteristics have become so fixed that they now breed true, but they have not yet been admitted to the *American Standard*.

The *Indian Games* include several sub-varieties, as the Java, Sumatra, etc. The Java Games are of various shades of plumage: the Sumatra Games are invariably black. These breeds differ from the English breeds in being larger and somewhat less active. They are formed more after the type of the Malay fowl. They have not yet been bred in this country to any great extent, as the Game fowl everywhere is lacking in one of the qualifications necessary to popularity here, and that is in disposition to lay. Originally bred exclusively for the pit, and that at a time when the value of fowls as food producers was but little thought of at best, it is not surprising that they are deficient in this respect. They possess other advantages, however, which should not be lost sight of, and for certain situations they are probably better adapted than any other variety of fowl.

The games are extremely hardy in constitution, when allowed to range, although they do not endure confinement well. In disposition they are the most courageous of all fowls, and this renders them especially valuable for situations where range is abundant, but where, as is usually the case in such localities, large vermin, hawks, etc., are troublesome. The following account of the courage of Game hens in defending their young is quoted by Tegetmeier from Mr. Hewitt:

"Not a doubt presents itself to my own mind that, viewed exclusively for their actual merits, unincumbered by the caprice of poultry fashion or individual prejudices, Game fowls are the most strikingly beautiful of any among the very numerous varieties of domestic poultry. Among any of the truly bred fowls of this variety, the superiority of gait and general contour strikes the eye of parties even the most indifferent and uninterested; and from this cause I have almost universally noticed that the avenues appropriated to the Games at our poultry shows are those most commonly thronged by visitors. In situations where a free, unlimited range can be tolerated, there is not a doubt that Game fowls will take care of themselves and their progeny more successfully than any other kind of poultry. Accidents of any kind where these advantages exist rarely occur; as of all poultry none are more vigilant in avoiding dangers, nor, again, so capable of repelling aggression; and many are the instances that recall themselves to my memory of cases in which powerful adversaries have found

a retreat suddenly forced upon them; or, if persisting in their attacks have at length been laid prostrate and powerless in the field, despite of the superior strength that was relied on for ensuring a very different issue. I will simply refer to a couple of such incidents, where prowess alone carried the day, and also where the odds were vastly in favor of the assailant.

"In a very rural part of Derbyshire, some ten or eleven years back, a Black-breasted Red Game cock (only a small bird, in weight about four pounds two or three ounces) was walked with three or four good hens, one of which had some chickens running with her, about a fortnight old. These latter were enjoying themselves in rather an exposed situation to the windward of some heather. A hawk, that was on the wing outlooking for the first prey that might offer, espied them, and, without the slightest warning, dashed violently at one of the chicks that had strayed farthest from its protector. The hen, however, instantly espied the coming danger, and flew, regardless altogether of self preservation, to the rescue. This first effort of the dauntless mother certainly saved the chicken, and drew the attention of the hawk more especially to herself. At this instant the cock, that was some twenty yards off, attracted by the outcries of his mate, went valiantly to the encounter, and on first meeting his unusual foe, was unfortunately clutched by the wing with one or both feet of the hawk, nor could the quickly-repeated efforts of the cock disengage itself. Although laboring under so material a disadvantage, he still fought on, and, as the result proved, successfully. It was in truth an up-and-down fight, sometimes the cock, at others the hawk, appearing to have the advantage; feathers flew around the combatants, and our eyewitness ran rapidly to the spot, in the hope to prevent the escape of the intruder. No services whatever on his part were required, as before he reached them, victory had favored or gallant hero. The hawk had received a blow from the spur of the cock, which, it should be borne in mind, was simply the natural one; it had entirely destroyed the right eye, and bursting through the skull at the back of it, penetrated the brain, so that death ensued instantaneously as by a gunshot. It was only with difficulty the spur could be disengaged, and the tenacious grasp of the hawk was maintained even in death. The cock proved but triflingly injured by the *melee*.

"The second instance was not, as above, a casual occurrence, but was premeditated by a couple of friends of mine, not only as a test of the dauntless valor of a Game hen, but to teach a useful and admonitory lesson to an intruder, whose fondness for chickens had added a somewhat extravagant item to the losses of a notorious poultry amateur, and that, too, among chickens of high merit and considerable pecuniary value.

"It seems that a large cat had for many weeks been making daily incursions, and had succeeded not only in taking a chicken at every visit, but had likewise very seriously maltreated the old hens on three different occasions. They were Cochins, and had become so alarmed by the frequent repetitions of these incursions as to scarcely make any attempt at protecting their chickens; and consequently the cat had increased in audacity daily. It was under these depressing circumstance that a brother amateur volunteered a 'certain cure,' if he were allowed unrestrained liberty as to all the means adopted—a proviso most cheerfully permitted. Having cooped up the fowls, both chickens and parent

birds, that usually had sole possession of the yard, he produced a most beautiful Game hen and chickens, the latter not more than three or four days old, the hen being armed with a pair of steel spurs, somewhat shorter than those used in the cock-pit, but well suited for the purpose intended; and, being naturally a spurred hen, they were easily and firmly attached. The lot being placed at freedom in the yard, the hen, from all around being strange, was necessarily restless, and the chickens equally noisy. Grimalkin, with stealthy pace, was soon seen crouching along a wall about nine feet high; the hen unfortunately at this moment had flown into the body of a covered cart, that prevented any possibility of her seeing the threatened danger. A spring from the wall placed puss in the possession of the nearest chicken, and all the spectators thought certainly one youngster was irretrievably forfeited to the experiment; but the idea was erroneous, with a shriek the hen flew headlong at the enemy of her brood. Puss seemed but little concerned at her fury, as the impunity with which she had faced other hens seemed rather to inspire her with confidence, all but amounting to imperturbability.

"Perceiving the coming attack, the cat loosed the chicken from her mouth, but instantaneously placed one foot upon it; and with hair erect looked defiantly; while a few deeply-drawn breathings at the window told how anxiously the lookers-on speculated as to the result. The Cochins, poor, heavy, domesticated dames, had always proved slow in their motions, and their efforts were easily avoided. Not so now; a blow the eye could scarcely follow, and a scream most dissimilar to the noise from anything feline, gave evidence that the contest was not so very unequal as it appeared to be. Two or three other blows, in the most rapid succession possible, made retreat evidently the only way that remained to the cat of making the best of an unlucky speculation; still, with an obduracy most remarkable, she once more seized the chicken with her mouth and sprang with it upon the wall. Nevertheless, bravery carried the day—the hen proved close to her heels, and another double rap brought both antagonists headlong back to the ground. The cat then loosed the chicken, bolted to another less exposed outlet, and the hen quickly commenced her muster-roll, which embraced the whole of her progeny, and none were injured, the hen herself escaping literally without a scratch; although her artificial helps were besmeared with gore. Some half year afterwards, I heard on inquiry that a longing, lingering look was still frequently indulged in by the aggressor, but always from afar—the cure was a certain one."

The rules of the show-pen require that Game-cocks shall be dubbed, a custom arising from the purpose for which these fowls were formerly bred, and which is still considered necessary by some breeders, where several cocks of this breed are allowed the range of the poultry-yard. The object of dubbing is to remove the comb, wattles and ear-lobes, and thus leave no point upon which an opposing cock may seize with his beak in fighting. The operation is performed by clipping off the protuberances with a pair of sharp scissors; and it should be done at the time the cocks have just attained their full growth.

HAMBURGS.

The Hamburgs, notwithstanding their Dutch name, are chiefly of English origin; but, like many other breeds of fowls, the several lines of their ancestry are so entangled that it is impossible to give a clear history of their first appearance.

As now known the Hamburgs comprise six varieties; namely, the Gold and Silver Pencilled, the Gold and Silver Spangled, the Black and the White. The Spangled varieties are also each built upon two distinct sub-varieties, whose peculiarities have not yet been entirely obliterated by their amalgamation.

The common characteristics of all the Hamburgs are small size, great activity, great egg-producing capacity, rose combs and great beauty of plumage.

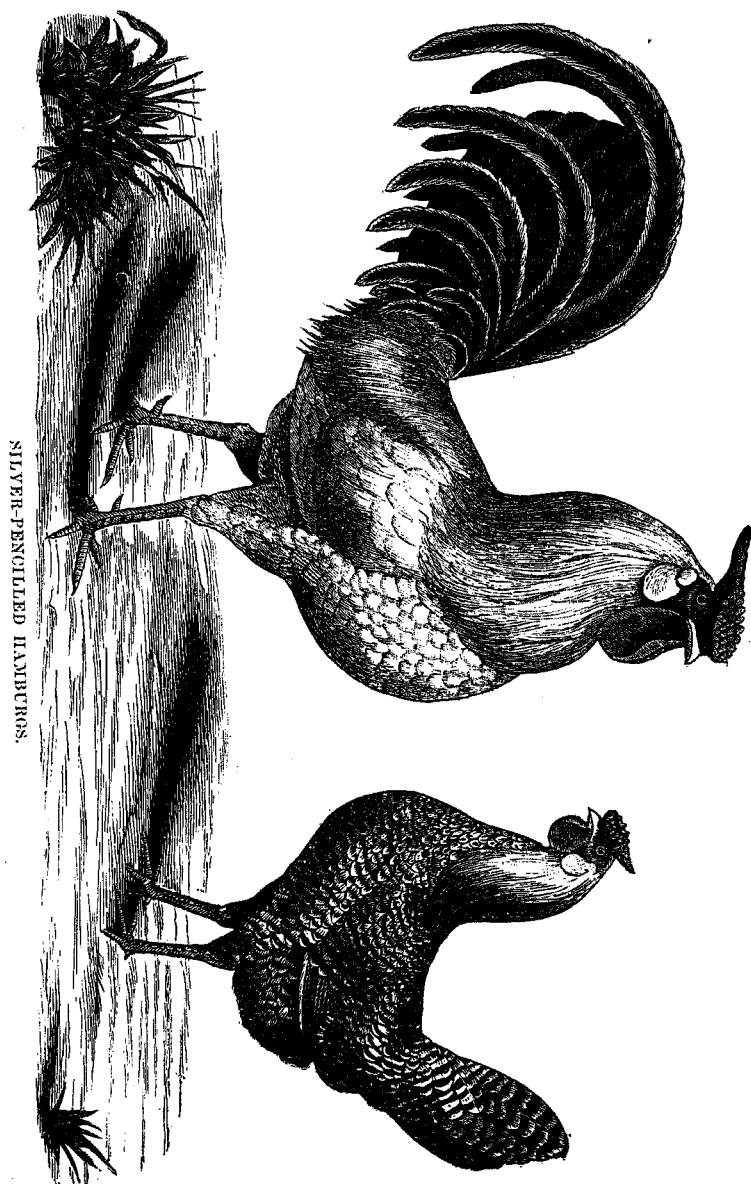
Silver Pencilled Hamburgs.—The Silver Pencilled Hamburg cocks have silvery head, beak, ear-lobes, neck-hackle, back, saddle-feathers, breast, body and thighs; the wings apparently white, when closed, but showing narrow stripes of black next the shafts or on the edges, when examined; the tail black and full, the sickle feathers having a narrow edging of white, as also the feathers of the tail-coverts. The hen has a silvery white head, beak, ear-lobes, and neck-hackle; the rest of her plumage being silvery-white, but each feather distinctly and evenly pencilled across with greenish-black bars; on the body it is desirable that these bars should form, as near as possible, parallel lines across the bird. The shanks of both cock and hen are blue or slaty blue. This breed has also been called the *Creoles*, from the mixture of white and black in the plumage; the *Bolton Grays*, from having been extensively cultivated around Bolton, in Lancashire; the *Coral*s, from the resemblance of the numerous red points of their combs to red coral; the *Pencilled Dutch*, the *Dutch every-day* or *everlasting layers*, from their origin and productiveness, and the *Chitteprat*, probably meaning diminutive hens. * (See illustration, page 113.)

In the *Golden-Pencilled Hamburgs* the white of the Silver-pencilled variety is replaced by a reddish-bay color in the cock and golden-bay in the hen, except on the beak, which is dark colored, and the ear-lobes, which are white.

The Pencilled Hamburgs appear to be of Dutch origin, having been imported from Holland under the names of "Pencilled Dutch" and "Dutch Everlasting Layers." For a statement of their merits Mr. Tegetmeier quotes as follows from Mr. Hewitt:

"The Hamburgs are excellent layers, provided they have free liberty on an unrestricted grass run; they are most impatient of confinement, particularly the Pencilled varieties, and very susceptible of disease wherever over-population and limited space are unfortunately combined. They shift for themselves better than any, excepting the Game, and are not, therefore, expensive as to keeping; indeed, I believe (in comparison to the food consumed) none produce so large an amount of eggs, taking the whole year from end to end, whether we estimate by weight in the aggregate, or by numbers; their chief production, however, is during the milder months. The flesh of Hamburgs is superior, and they are always, as chickens, in fit condition for the spit, if only tolerably well

* Tegetmeier.



SILVER-PENCILLED HAMBOURS.

fed, without any additional preparation. Being a small-boned fowl they prove, when carved, to be much more fleshy than might be imagined at first sight.

"They generally roost high, and in places difficult of access, if any possible chance of doing so presents itself; combined with this, if disturbed during night-time, they never cease screaming violently until destroyed outright; hence I have known many instances where midnight prowlers after hen-roosts have been at once detected, or luckily prevented absconding with their booty, the reiterated cries of alarm from their victims calling forth the immediate aid of the proprietor. In case, too, of attack from vermin, their agility preserves them from injury; for on such occasions they will fly like pheasants, and readily take to trees or the highest buildings.

"I have, during my somewhat lengthened experience in poultry matters, met with a few isolated instances in which Hamburgs have incubated their own nests of eggs steadily, and afterwards manifested the most exemplary attention to their chickens; but such cases are very few, and quite opposed to the general rule.

"The Hamburgs are extremely ornamental varieties of poultry, and form very striking additions when standing in groups near any homestead; this, combined with their extraordinary production of eggs, the excellent quality of the flesh, together with the very small amount of care they entail, causes them to be almost universal favorites.

"There is one drawback to the value of both Gold and Silver-Pencilled Hamburgs, and that, it must be acknowledged, is a serious one. If hatched in the early spring of the year, say before May, they are difficult to rear, being very delicate during chickenhood, and suffering severely in cold, wet weather; and the old birds are perhaps more subject to roup, if kept in damp, cold, unhealthy situations than any variety of fowls, except, perhaps, Black Polish."

In the *Silver Spangled* Hamburgs the plumage of both cock and hen is clear white, but each feather is tipped with a large, greenish-black moon or spangle, the spangles increasing in size with the feathers, and so arranged as to present a rayed or starry appearance on the hackle and back, and to form two parallel bars across the wings. The ear-lobes should be white, and the beaks and shanks blue.

The *Golden Spangled* Hamburgs have the same reddish-bay and golden-bay ground-color as the Golden Pencilled variety, the feathers of the neck-backle and saddle are striped down the shaft with glossy, greenish-black; the tail is a glossy black, while the other feathers end, as in the Silver Spangled variety, with glossy-black spangles.

The Spangled Hamburgs are of English origin, and are made up of four separate breeds; namely, the *Golden* and *Silver Mooneys*, originated by the colliers, hand-loom weavers and others in Lancashire, and named from the moon-shaped spangles on their feathers; and the *Golden* and *Silver Pheasants*, named from their resemblance to the wild pheasant, and of Yorkshire origin. These breeds have been amalgamated—the Golden Mooneys with the Golden Pheasants and the Silver Mooneys with the Silver Pheasants—thus producing the two breeds of "Spangled Hamburgs." These breeds are somewhat larger and somewhat harder in constitution than the Silver-pencilled Hamburgs; and equally good layers, and no more inclined to sit.

Black Hamburgs—This breed was originally exhibited in Lancashire under the name of Black Pheasant; but it has latterly been crossed with the Black Spanish, as shown by the increased size—cocks weighing six or seven pounds—by the tendency toward a white face, drooping ear-lobes, and nearly smooth, mis-shapen combs.

The general color of the plumage is a jet black, each feather terminating in a velvety-green spangle, which gives a rich, glossy appearance to the plumage.

In disposition the Black Hamburgs are rather wild; as layers they are unsurpassed, and in constitution they are superior to either of the pencilled or span-gled breeds.

White Hamburgs—This breed is not mentioned by Tegetmeier, but is recognized by the *American Standard*. It has been produced by selecting the lightest marked of the Silver-pencilled variety, also, possibly, by breeding albinos of the Black Hamburgs. It seems defective in hardiness, but this is probably largely due to the close in-breeding required to fix the breed. The White Hamburgs have the Hamburg shape, size, and rose-comb, with perfectly white plumage throughout.





CHAPTER XI.

THE FRENCH BREEDS.

From the character of the rural population of France, being largely peasant proprietors, and noted for their small economies, we should expect the poultry interest to receive a large amount of attention in that country. That such is the case is shown by the facts that several very valuable breeds of fowls are of French origin; that the products of the poultry-yard are nowhere more generally used as food than in France; and that France exported to England alone, prior to the Franco-Prussian war, between four hundred and five hundred million eggs annually.

HOUDANS.

Of the various French breeds of poultry the Houdans have been received with the greatest favor in England and America. The name is derived from that of the chief market town of the arrondissement of Mantis, department of Seine-et-Oise, near Paris. The annual sales of fat poultry at Houdan, according to Tegemeier, have reached the sum of \$370,000; while in the arrondissements of Dreux and Nogent-le-Soi, of the same department, the sales reach \$464,000 and \$325,000, or a total trade of \$1,160,000 for a department a little over two thousand square miles in area. It is true the breed of fowls known as Houdans are not the only breed of this region, many cross-bred fowls being found there as elsewhere; but we should expect the characteristic breed of a region doing such a large business in poultry to possess certain valuable qualities in a high degree, and this is certainly the case with the Houdans.

In size and shape this breed closely resembles the Dorking, even to the peculiarity of the fifth toe; but in addition to these Dorking characteristics it possesses the crest and non-sitting qualities of the Polish fowls, hence it is supposed by some that it has actually been derived from a cross between those breeds. The plumage of the Houdan, including the crest, is white, spangled with black, the spangles being frequently of considerable size, and varying in number, so that the fowl may show all gradations of color from nearly white to nearly black. The comb is triple, very large in the cock, but sometimes scarcely perceptible in the hen. Both cocks and hens are bearded. They are excellent table fowls; the flesh being of fine quality, and, like that of the Dorking, being found well developed in the finer parts, while the bones are much finer than those of the Dorking. They are good layers of large, white eggs, and are but little inclined to sit.

The chickens are hardy, feather early, and mature rapidly. (See illustration, page 117.)

CREVECOEURS.

This breed belongs to Normandy, where it has been bred especially as a table fowl for the Paris market. In France this fowl was so much esteemed "that at the first great Agricultural Exhibition in Paris, in 1855, there were two equal sets of prizes offered for the poultry exhibited; the first for Crevecœurs, the second for all other varieties taken together."* They have not become so popular in England and America, however, as they do not endure change of climate well, being especially affected by cold, damp weather.

In size the Crevecœurs are large, the cocks weighing eight to ten pounds; they are very short legged, the hens so much so as to appear almost like Creepers; the plumage is black, or black and white, sometimes golden or silver colored in the cocks; they have large tufts, and small, upright, two-horned combs; they are very tame, not inclined to sit, and only moderate layers. There is no doubt of their value as table fowls, but their lack of constitution and shyness in laying have prevented them becoming popular in this country.

LA FLECHE.

This breed appears to be a cross between the Crevecœur and the Spanish fowls. The plumage is black and close; the ear-lobes white—like the Spanish; the combs two-horned, with the peculiarity of having two little studs or points just in front of the nostrils; the wattles are long and pendant, and the shanks black, which interferes with their value as table fowls. Their size is about the same as the Crevecœurs, and the flesh is of fine quality.

The La Fleche resemble the Spanish in being good layers, but poor sitters; but they follow the Crevecœurs in lack of constitution, hence they are not likely to become popular in this country, except, possibly in the Southern States.

BREDAS, OR GUELDEFS.

This is another French breed, but is little known outside of its native district. The following account of it is given by Tegetmeier:

"Guelders are birds of medium size, with very full, prominent breasts, and large, flowing tails. Their most striking characteristics are in the head, which is ornamented with very large, pendant wattles, but is destitute of either feathered crest or comb, unless the existence of one or two red points—which are often entirely absent—can be regarded as the latter organ in a very rudimentary condition. Their color is generally either gray, cuckoo, or pure black, but we have seen them spangled, like a Golden Polish.

"There is no doubt whatever that Guelders were originally a sport from the feather-crested Polish family. The black variety looks exactly like white-crested black Polish, wanting the crest; there is the same form of body, fullness of chest, largely developed, pendulous wattles, and nostrils flattened and deformed from the absence of the inter-maxillary bones.

* Tegetmeier.



"In those spangled birds that we have seen the analogy to the gold-spangled Polish was equally close, the birds being as fully bearded as the most ardent Polish fancier could desire.

"The Cuckoo Guelders have large, pendulous wattles like the black, and some of the American birds of this color have strongly feathered legs.

"Guelders are very good layers, and, as might be expected from their close affinity to the Polish, are none-sitters. They may be correctly characterized as very useful fowls for family purposes, carrying a great amount of flesh on the breast, but they are rather too small to furnish first-class fowls for the market. They are not quite as large as the Houdans, but are equally hardy. They are abundant layers, of very fine, large fertile eggs. It would be difficult to say which do better, the Houdan or Guelder chickens. I like this breed so well that I class them next to the Houdans."

The Guelders are not described in the *American Standard of Excellence*.

Several other native breeds of fowls are described in French works on poultry, but they are not generally sufficiently distinct from those described nor widely enough propagated to justify an extended description here. Among these may be mentioned the La Bresse, a fowl of mongrel type, which is largely reared in the populous district of La Bresse in the north-eastern part of France, where it is fattened by the cramming process.

Another breed is that of Mans, which resembles the Crevecœurs, and is said to be popular in the French markets.

It will be noticed that the French breeds are generally table fowls, for which purpose they are carefully bred, smallness of bone and offal, and high quality of flesh, being far more sought after than uniformity of feather—a point in which English and American breeders might well take lessons.



CHAPTER XII

THE MEDITERRANEAN BREEDS.

Along the whole northern coast of the Mediterranean, from Gibraltar to Syria, fowls are kept in immense numbers, and of types which bear a strong family resemblance, although no where is such care bestowed upon their breeding as in England and the United States.

Among these breeds the

WHITE-FACED BLACK SPANISH

was one of the first to become naturalized abroad, and it has had an era of great popularity on both sides of the Atlantic. This breed was probably first obtained by the Dutch, through the Spanish occupation of the Low Countries, and was by them so carefully bred as to improve upon the original stock.

The most marked characteristic of this breed is the white face, the white color extending with age until it surrounds the eyes. In aged fowls the face is liable to be disfigured with folds and wrinkles, sometimes to such an extent as to obstruct the sight: this excessive growth is a disqualification in the show-pen.

The comb is single and very large; stiff and erect in the cock, but drooping in the hen. This large comb is sometimes a detriment in cold climates, as it is very liable to become frozen.

The plumage is black or green-black; there are sometimes one or more white feathers, from the tendency of all black animals to produce albinos occasionally, but the presence of any other color is a sure indication of impurity of blood.

The legs should be blue or leaden blue. Any other color is a disqualification in the show-pen.

Except from the tendency of the combs to freeze the Black Spanish is a hardy breed when grown. The chicks are not considered quite so hardy as in some other breeds. As layers these fowls are very valuable, the eggs being very large and the hens beginning to lay young, and laying throughout the summer with but little intermission. They are but little inclined to sit. As winter layers the Black Spanish are not considered equal to breeds of Asiatic origin, and they are not a first-class table fowl, being of only medium size; but for situations where there is plenty of range, and eggs are sought rather than flesh, a cross of this breed upon the common fowl has given excellent satisfaction. (See illustration, page 121.)

Andalusians.—These fowls have become established favorites both in England and America. In size and weight they resemble the Black Spanish; in color the plumage varies from dark slate to dove color; the hens being a bluish grey. The legs and feet are blue, and totally destitute of feathering; the combs, both of cock and hen, resemble those of the Spanish; the wattles are well-developed. The ear-lobes are white, but the face is red: the breed, in this respect, resembling the Minorcas.

The Andalusians are good layers and non-sitters; their chicks are hardy and feather early; in disposition they are inclined to be rather wild.

Minorcas.—These are a variety of the Black Spanish, resembling that breed in plumage, comb, ears, shape and laying character, but being without its white face—the ears only of the Minorcas being white—and being somewhat larger and shorter legged. They are said to be very popular in the west of England, and would seem to be worthy of more attention than they have received in this country, especially for crossing with other breeds.

White Spanish.—This is a white variety of the Black Spanish, originally produced, no doubt, by the well-known tendency of black birds and animals to produce the white sports called albinos.

Neither this breed nor the preceding is recognized in the *American Standard*, showing that they are considered of little value in this country.

LEGHORNS.

Like many, and in fact most of the other breeds of fowls, the name of the Leghorns is not a sure index of their place of origin. Indeed, their special characteristics are due to the care and skill of American, rather than of Italian breeders, as is evidenced by the fact that it was from America that they were first, and are still, chiefly disseminated as a separate breed. Their origin is traced to importation by ships trading to the Mediterranean ports. Whether they were first obtained at Leghorn, at Padua, or at some other Italian port, cannot now be determined.

There are several sub-varieties of Leghorns, of which the

White Leghorns have been longest known. The White Leghorns closely resemble the old White Spanish, the principal difference being in the color of the legs; those of the Spanish being gray or blue—those of the Leghorns yellow. The following description of this breed is from Tegetmeier, as it appeared in the second edition of his "Poultry Book" (1873).

"To our American cousins is due the credit of having introduced certain admirable breeds of poultry. The Brahmas are undoubtedly second to none as useful fowls, being unsurpassed for size, hardihood and fertility amongst the incubating breeds. Another race, which is equally popular in the United States as being at once most useful and ornamental, is that known as the White Leghorn. These fowls are hardly, if at all, known in this country; but, having tested their merits for two seasons, I can report most favorably of them, and fully indorse all that has been said in their favor on the other side of the Atlantic.

"White Leghorns are birds of the Spanish type, but with white in the place of

black plumage. Their legs are bright yellow, and perfectly free from feathering on the shanks. The faces are red, the ear-lobes only being white. The comb in the cock is thin, erect and evenly serrated. In the hen it falls over like that of a Spanish hen. The tail in the cock is exceedingly well-furnished with sickle-feathers, and in both sexes is carried particularly erect. The birds are active, good foragers, and have a sprightly and handsome carriage.

"I find them to be abundant layers of full-sized eggs; the hens rarely showing any inclination to sit, but laying the whole year round, except during the time of the annual moult. The chickens are very hardy. Unlike those of the Spanish, they feather quickly and mature rapidly.

"I regard these fowls as an exceedingly useful as well as ornamental addition to our stock of poultry. Whatever competitive shows may have done for other breeds, they have certainly materially lessened the value of Spanish as useful fowls. In the place of the large, prolific, hardy breed which was formerly known under that name, we have a smaller race, very leggy, and feathering with such slowness that chickens are often seen in prize pens that have not produced their tail-feathers. In fact, the useful qualities of the race have been neglected in breeding for face and ear-lobe.

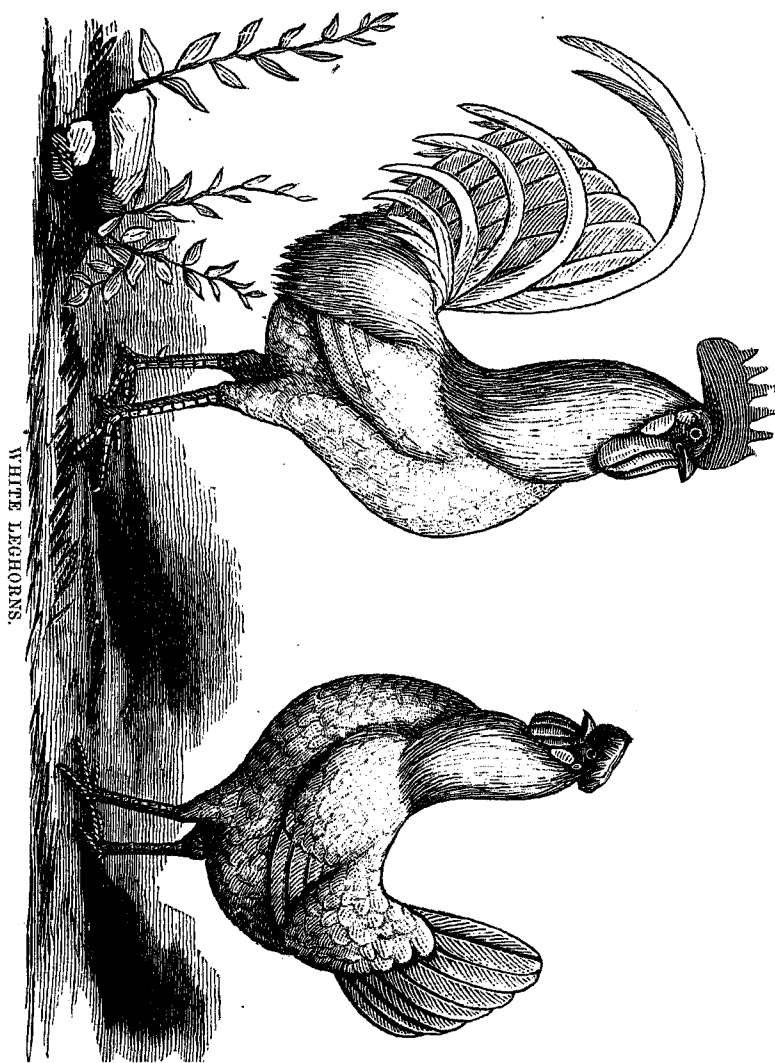
"The Leghorns possess many of the Spanish merits without their drawbacks, and I have no doubt that they will become as great favorites in this country as they are in America." (See illustration, page 127.)

Rose-Combed White Leghorns.—Certain American breeders are attempting to substitute the rose-comb for the ordinary comb of the Leghorn fowl, claiming this style of comb to be preferable on account of superior beauty and non-liability to freeze. These rose-combed fowls have not yet been acknowledged in the *Standard*.

The Brown Leghorns.—This is to-day the most popular of the Mediterranean breeds in America, and one of the most popular breeds of any kind. At the time of writing the above description of the White Leghorns, Mr. Tegetmeier says that the Brown Leghorns "have not been imported into England," and he quotes their description from the *American Standard*.

With regard to the origin of this breed of fowls Mr. H. H. Stoddard, editor of the *Poultry World*, makes the following statement: "About 1835 (the exact date is unknown) Mr. N. P. Ward, of New York City, received direct from Italy a few Brown Leghorn fowls, which, in his hands, undoubtedly proved their claims to superior merit; for, though he wrote nothing which has been preserved about them, he gave eggs and fowls to his friends, one of whom was Mr. J. C. Thompson, of Staten Island. Mr. Thompson was greatly interested in the breed, and gave an account of their marvelous precocity and early fecundity, which was similar to the characteristics of the fowls now bred. The pullets matured and commenced to lay at the age of four months, and, though we have no statistics of the male side of the house, there is little doubt that the cockerels showed as early development as the pullets.

"At a subsequent period Mr. Thompson, who seems to have been a most enthusiastic fancier, sent by his son-in-law, who was a sea captain, for an additional supply of the fowls, and received birds that had the same markings as those first imported and exhibited the same precocity. In a letter published after breed-



ing them several years, and when the fresh blood of various importations forbade the idea of deterioration through too close in-breeding, this pioneer breeder expresses the opinion that pullets frequently laid themselves to death.

"For some time after this, however, there was little known of the fowls, and when, in 1852, they made their entry into Mystic River, Conn., not one poultry breeder in a hundred knew what they were, or what were their peculiar merits. They speedily learned the latter, however. The following year a second lot of birds arrived at Mystic and were distributed among the friends of Captain Gates and the first officer of the vessel, Mr. Morgan, who still lives in the town of Groton and corroborates the details of the importation. From this time the dissemination of the breed was very rapid, and its popularity advanced speedily all through New England, where it was known as the Red Leghorn.

"Beside the importations we have spoken of, there were, undoubtedly, others which helped fill the demand for the breed, but no record of them was ever published."

The Brown Leghorns are of medium size, very active, great layers, and non-sitters; they have medium to large single combs, which in the hen droops to one side. The ear-lobes are white or creamy white, and fit close to the head; the wattles bright red, long and pendant. The necks are long and graceful; yellowish brown, striped with black in color, the colors being brighter in the cock; the backs are dark-red in the cock, dark-brown in the hen, pencilled with lighter colors in both; the breasts are black in the cocks and salmon-brown, shading off light under the body in the hens; the wings are large, shading from dark-red to black in the cocks, and being dull-black, pencilled with brown, in the hens. The shanks are long and yellow; the feet small and yellow, with a delicate dark stripe down each toe. (See illustration, page 131.)

Black Leghorns.—Of the origin of this breed the editor of the *Poultry World* says: "The first importation of this breed from Italy, regularly bred from, of which we have any authentic account, was made in 1871, by Mr. Reed Watson, although stray specimens of black, or very dark fowls, were no doubt brought over at various earlier times. *Saunders' Domestic Poultry*, published in 1866, says: 'There have been several importations of the common fowls of Leghorn and vicinity made of late. These birds are of all colors except black.' By which we infer that the breed under consideration was at that time unknown to the author cited. Wright makes no mention of any Leghorns of this character. There are traditions, however, of several dark or black hens having been found among the Brown Leghorns brought to this country at various times since 1853. The first published account of Black Leghorns appeared as an editorial in this magazine in October 1872. Since then they have become widely known. We quote: 'Mr. Reed Watson, of East Windsor Hill, Connecticut, has some Black Leghorn fowls, direct from the vessel in which they were imported from Italy. Mr. Watson's birds show the unmistakable Leghorn form, even to the details of comb and wattles, and are as thoroughly non-sitters as any of our acclimated strains. They are very vigorous and active. The original fowls, three in number, imported a year ago, are now surrounded by a well-grown and numerous family. The old hens have proved themselves remarkably prolific layers, and the pullets of last April are following the example. A brood of a dozen chicks can be seen,

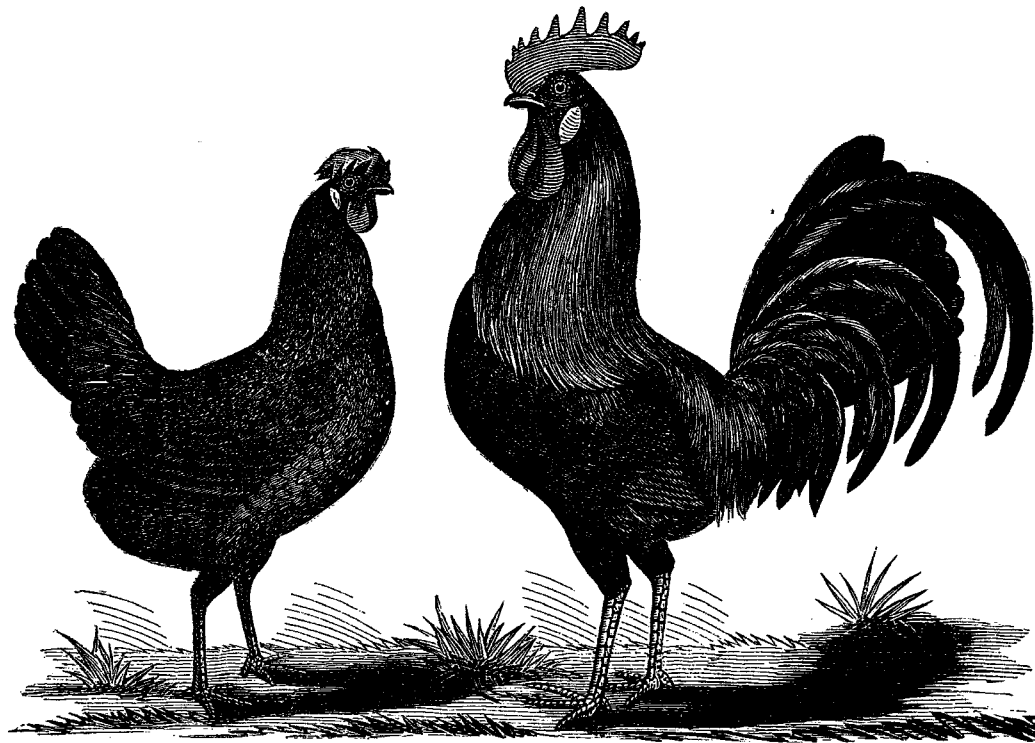
hatched September 1st, from eggs laid by pullets of this stock, hatched after the middle of April last. That is, the pullets reproduced when less than four months old.”

Mr. Watson made fresh importations during subsequent years, and the breed is now recognized by the *American Standard*. It differs from the Brown Leghorns in the jet-black plumage of both cock and hen, and in the dark color of the shanks, they being yellowish-black, or nearly so, to meet the requirements of the *Standard*.

Dominique Leghorns.—These were admitted to the *American Standard* at the same time as the Black Leghorns (1874) and are distinguished from other varieties merely by their plumage.

Spangled Leghorns, Buff Leghorns, etc.—These varieties are in the hands of breeders, but have not yet bred so true to feather as to gain access to the *Standard*.





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BROWN LEGHORNS.

CHAPTER XIII.

THE POLISH BREEDS.

Our readers have learned, by this time, that the name of a breed of fowls is not to be regarded as a sure indication of the place of its origin, and this is especially the case with the breeds called Polish. In the sixteenth century a Bolognese scholar, Ulysses Aldrovandi, better known as simply Aldrovandus, wrote a voluminous work on natural history, in which he described and figured a number of varieties of fowls, among which was a crested fowl, which he called the Paduan, or Patavinian. From his description of this fowl it was evidently the progenitor of the modern breeds called Polish. How this name became attached to these fowls cannot now be determined; certainly not on account of either their origin or subsequent naturalization, as they are said by Mr. Tegetmeier to be unknown in Poland. It is surmised by the latter authority that the name may be derived from the peculiarity of the head, or poll, and that *polish* or *polled* has become *Polish*. Taking this peculiarity as their chief characteristic it would seem appropriate to include all the crested breeds—the Houdans, Crevecoeurs, etc.—among the Polish, and this is done by some authorities.

Of the characteristics common to all Polish fowls the most peculiar, as above stated, is the crest, which in the cocks is composed of long and pointed feathers, closely resembling those of the hackle, and in the hens of feathers of the ordinary character—rounded at the extremity. This crest in both sexes rises from a globular protuberance, situated on the fore-part of the skull, and formed by an enlargement of the skull itself; the size of the crest is proportionate to the size of this protuberance. As this enlargement commences before birth it is possible to select birds which shall be well crested, as soon as they are hatched, by noting the comparative sizes of their protuberances. The comb of crested birds is generally very small, sometimes almost entirely extinct, but when present it is always double, its two horns giving it the appearance of an inverted crescent. Owing to a deficiency in the bones of the upper mandible, the nostrils of crested fowls are generally somewhat flattened.

White Crested Black Polish.—These are the oldest and best known of the Polish fowls. On dry soils, and where not unduly exposed to rain or wind, they are almost unexcelled as layers, being non-sitters; but in exposed, wet situations they are extremely liable to roup and other disease, and when once diseased are extremely difficult to restore to health. In size they are medium, the hens weighing four to five pounds, the cocks five to six. Their distinguishing characteristics are a large, white crest; no comb; large, red wattles; white ear-

lobes; and deep black plumage, with iridescent tints on the neck, tail, and saddle-feathers. There should be no admixture of black feathers through the crest, though there will always be a few small ones in front of it, but the fewer and smaller these are, the better.

This breed shows a tendency to produce white or white-tipped feathers through the plumage. The appearance of small spots of white on the tips of a few of the feathers is regarded only as a defect; but if these spots are an inch or more in length they disqualify the bird from competition in the show-pen. (See illustration, page 135.)

This tendency towards white in the plumage has been encouraged in different directions until three different varieties have been produced in addition to the one just described; namely, the Silver Spangled, Golden Spangled, and White Polish. Of these it would seem that the last named should have been the first sport from the original stock, from the tendency of black fowls to produce albinos. In the attempt to fix a breed having the characteristics of these albinos it would seem natural that fowls would be produced in which the white plumage would be spangled with black. This, however, is merely conjecture, as we have no history of the origin of these sub-varieties.

The Silver Spangled Polish, or simply Silver Polish, as they are now frequently called, are distinguished from the White-Crested Black by having entirely white plumage, except that each feather is tipped with black, either, in the form of a spangle or lacing.

The Golden Spangled Polish, or Golden Polish, differ from the above in that the white of the Silver Polish feathers is replaced with a golden-bay color in the Golden Polish.

The White Polish differ from the White-Crested Black in having a clear white plumage throughout. This plumage may become tinged with yellow in old birds.

Bearded Polish.—Each of the three varieties last named is duplicated by a strain which possesses a tuft of feathers similar to those of the crest, which forms a "beard," and which almost completely hides the small and imperfectly developed wattles.

These "Bearded Polish" fowls have lately become very popular, some fanciers insisting that they are superior in size and vigor to the non-bearded varieties.

The term *laced* would better characterize the plumage of the parti-colored Polish breeds than *spangled*, hence the latter term has been dropped from their nomenclature by the *American Standard*, although either spangled or laced plumage is admissible. In weights the laced or spangled breeds are slightly heavier than the black.

Blue or gray fowls are occasionally produced from the White Polish; cuckoo colored birds are an occasional variation of the spangled breeds; and *Buff*, or *Chamois Polish* have been developed in France from the Golden Polish, but none of these variations have yet been permanently fixed. With reference to these changes of color Mr. Tegetmeier says:

"It is a singular circumstance, that when a variation of color takes place in the plumage of birds, the change from black to white appears to be much more easily effected than from any other color to white. Thus, when Black-Red and White Game fowls are crossed, Piles are produced, in which the black disappears,

but the red of the saddle and hackle remains. By crossing a Golden Spangled and White Polish, these Spangled Buff or Chamois Polish are produced, in which the black spangle of the golden bird is changed into the white spangle of the buff, the ground color remaining unchanged."

Black-bearded Polish are occasionally seen, but have not yet become a fixed variety. There once existed a *Black-crested White Polish*, but the variety has become extinct.

In conclusion it may be said that the Polish, like the Hamburg strains, are especially valuable for their beauty, and for their egg-laying propensities; but they are better adapted to the wants of the gentleman of leisure than to those of the poulterer who wishes to make a profit from his fowls, owing to their small size, liability to disease, and the difficulty of breeding them true to color.



CHAPTER XIV.

THE AMERICAN BREEDS.

As has been previously stated, the introduction of the Shanghai fowl, during the fifth decade of the present century, was the origin of a deep and widespread interest in poultry breeding, which has resulted in the great improvement of many imported breeds, as well as the production, by crossing these breeds with each other and with the original mongrel stock of the country, of several entirely new breeds.

Among these the Light Brahma might appropriately be classed, as there seems to be no evidence that this breed exists in India or China in the shape in which we know it. The Brown Leghorn is another breed which owes its origin to the selection of American fanciers. As these breeds, however, retain in a very marked form the characteristics of other Asiatic or Mediterranean breeds, they are described in those classes, while only such as have been produced here by a more independent method of crossing are ranked as American breeds.

Of those thus described the Erminettes and American Sebrights have not yet been admitted to the *American Standard*, but the great interest being taken in the latter, especially, must soon result in its admission. Other crosses are being made in different directions, and the list of partially established American breeds might be indefinitely lengthened, but none have yet been prominently before the public sufficiently long to give a reasonable assurance of becoming permanent.

THE PLYMOUTH ROCKS.

In 1849 Dr. J. C. Bennett, of Plymouth, Mass., exhibited a cross-bred strain of fowls which he called "Plymouth Rocks." These fowls were the result of crossing several Asiatic breeds and the Dorking, and were of uncertain, motley colors. For a short time they maintained a degree of popularity, but they soon deteriorated and eventually became extinct.

Several years after the practical extinction of Dr. Bennett's Plymouth Rocks, a new breed sprang up, apparently simultaneously, from several parts of New England, and, as a matter of course, as soon as the breed had had time to demonstrate its good qualities, and to prove that the most valuable cross of a century had been made, numerous claimants arose for the honor of having originated it, and a second "Light Brahma" war was waged with great determination, one party claiming that a Mr. Spaulding, of Putnam, Conn., produced the genuine Plymouth Rocks in 1866 by a cross between a "hawk-colored"



WHITE-CRESTED BLACK POLISH.

dunghill cock and an Asiatic hen; another party claiming to have used "Dominique" and "Black Java" fowls in making the cross, etc. Upon this point the editor of the *Poultry World* wrote as follows in March, 1876:

"When the smoke is cleared away it will be found that this breed (the Plymouth Rock) has had several independent origins. As oil and potash may be united and soap made anywhere, so hawk-colored barn-door fowls may be amalgamated with some Asiatic variety in any State in the Union and Plymouth Rocks formed.

"Mr. A. H. Drake, of Stoughton, Mass., has a strain of Plymouth Rocks which he has bred for about nineteen years (he does not give the exact dates), which has not a drop of the Spaulding blood, nor the slightest admixture from any other strain. The basis of this breed was native, hawk-colored fowls found in Mr. Drake's neighborhood. Mr. Drake added something else to this basis, but does not tell what. Mr. Spaulding's Plymouth Rocks were founded, in part, on hawk-colored barn-door fowls. So were Mr. Upham's. We have word from a Pennsylvania correspondent that on farms in Bucks county, in that State, fowls have been found almost from time immemorial, that were identical with Plymouth Rocks, and were produced, incidentally, by the introduction of Asiatic blood into the common hawk-colored stock of the country. It must be kept in mind that upon many farms in all parts of the land, twenty, fifty or one hundred years ago, hawk-colored fowls were common. The modern Dominique fowl is nothing more nor less than the hawk-colored, dunghill bird, improved by cultivation. For that matter so is the Leghorn a genuine Italian dunghill fowl, improved. And the Brahma is simply an Asiatic dunghill fowl; and the same may be said of all the pure-bred varieties."

In our own earlier poultry experience, in farm-yards where the old "Shanghæes" had been crossed upon the common dunghill fowls, fowls with the peculiar plumage of the Plymouth Rocks were a frequent occurrence; but no effort was made to perpetuate this peculiarity, although "the old Dominica hen" was sometimes more highly esteemed than any other inhabitant of the poultry-yard.

In further confirmation of this theory of the origin of the Plymouth Rock may be noted the fact that the crossing of a pure Plymouth Rock cock upon a pure Light Brahma hen produces a fowl which can scarcely be distinguished from the pure Plymouth Rock.

Whatever may have been the origin of the Plymouth Rocks, however, they are certainly to-day the most popular breed of fowls in the United States, and deservedly so, since they combine more qualities valuable to the general poultryman than any other single breed. Hardy, excellent layers, early in maturing, of good size, docile, and of beautiful plumage, they are pre-eminently the farmer's fowl.

As now bred the Plymouth Rocks are of two shades of the same bluish-gray color, resembling that of the Dominiques; the cocks being a few shades lighter than the hens. The cocks show a tendency to breed quite light, and the hens quite dark, which destroys the uniformity of the poultry-yard, a point which it is desirable to maintain when not inconsistent with more valuable features. The *Standard* requires that birds shall match in the show-pen; and, to comply with this requirement it is customary to make two matings, one of uniform fowls

for the show-pen, and one in which the cock is lighter colored than the hens—a very light cock with very dark hens, and a cock of medium shade with hens less dark, for breeding purposes. This is a troublesome practice, and we have no doubt that before many years fowls of extreme coloring will be discarded as breeders, and thus a more uniform strain produced, in which there shall be little or no difference in the shading of the two sexes.

The cocks frequently show a tendency to a brassy coloring on the back and wings, which the *Standard* discourages, and which fanciers are endeavoring to breed out. In both sexes there is a considerable tendency to blue legs, which breeders are endeavoring to get rid of; bright yellow legs and beak being required in *Standard* fowls. In general shape the Dorking type is advocated by our best breeders, while in size the Plymouth Rocks rank between medium and large, the standard weight for the cocks being ten and a half, and for the hens eight and a half pounds.

The chicks feather early, those of a few weeks old being completely covered. They are also hardy and easily reared.

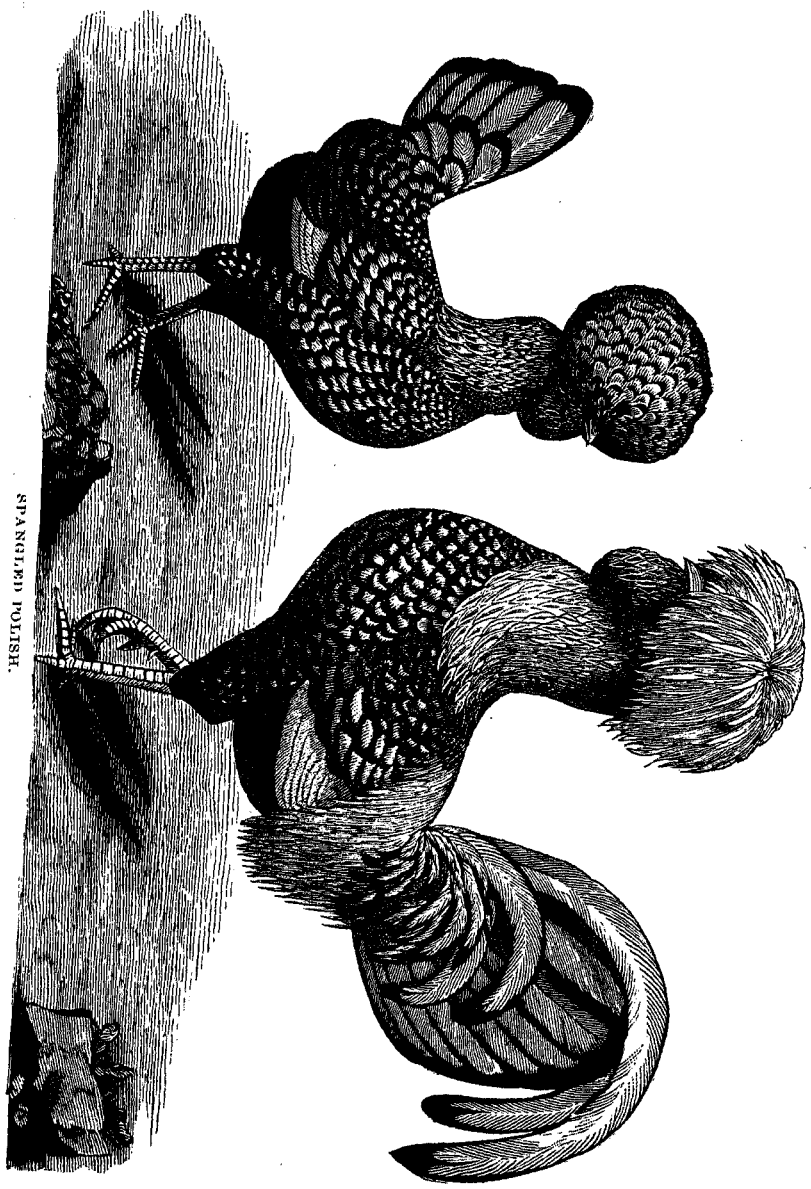
The great popularity of these fowls, and the consequent demand for them, has prevented that care in selection which is essential to the highest success, and therefore many very inferior fowls have been used as breeders, with the effect of very much retarding the development of the strain. It is to be hoped that as they become more abundant and less high-priced the attention of fanciers will be more strongly drawn towards the developing of the very good qualities which the breed possesses. Otherwise we shall soon begin to hear of its decadence.

One of the signs of danger in this direction is the fact that there are frequent complaints of infertility in Plymouth Rock eggs; a trouble which should be guarded against by avoidance of in-breeding, by allowing but few hens to the cock, and by breeding only from the thriftiest cocks. (See frontispiece.)

AMERICAN DOMINQUES.

This breed has the peculiarly marked plumage of the Plymouth Rocks, and is supposed to be one of the parent stocks of that breed. The Dominques, however, have more of the Dorking type of form, having rose combs and large and spreading tails: their plumage, moreover, has more of a bluish tinge, so that they are described by English journals as resembling the Cuckoo Dorkings. The Dominiques, like the Plymouth Rocks, should have smooth, yellow legs, and should not show any brassiness in the saddle feathers of the cock. They are somewhat smaller than the Plymouth Rocks, cocks weighing from seven to eight pounds, and hens from five to six. They are good layers and sitters, and careful nurses.

There can be no doubt that this breed is simply an improvement of the old hawk-colored, or Dominique fowl of the barn-yard, the rose-comb probably having been added by a cross with the Hamburgs.



SPANGLED POLISH.

ERMINETTES.

This is a new American breed, originated by Mr. John H. Sutcliffe, of Bristol, Conn., from a cross between a small pair of fowls brought from the West Indies, which resembled the Leghorns in size and shape, but whose plumage was white, evenly splashed with solid black feathers. By judicious crossing with the larger breeds Mr. Sutcliffe has been able to produce a fowl having this peculiarly splashed plumage, combined with large size, feathered, yellow legs, and small combs.

The Erminettes were first shown at the exhibition of the Central Connecticut Poultry Association, held at Bristol, in December, 1874.

AMERICAN SEBRIGHTS, OR SEBRIGHT COCHINS.

The first mention we find of this breed occurs in the *Poultry World* for March, 1876, in an article on "New Varieties," by D. W. Hooker, who writes:

"Where and how this variety originated I am unable to state, after diligent inquiry. It has marks of both the Brahma and Hamburg. The head is crowned with a good, double comb; wattles and ear-lobes both red and of medium size; hackle black, striped with white; back broad, with black, Brahma-like tail; breast white, deep and broad, and back and breast feathers deeply laced; wings, primary feathers mostly white, and lower-wing coverts tipped with black, making a distinct bar; legs short and slightly feathered, coloring throughout clear black and white, with a tendency to gray on the hackle and saddle; weight, about eight pounds for the cock and six for the hen. Their valued points are that they are good layers the year round; they are not troublesome to break up from sitting; they are fine for the table, dressing a rich yellow; and while being good foragers, they are not disposed to fly.

"Though possessing the characteristics of a pure breed, so marked as to be distinguished the moment the eye rests upon them, they have not yet bred true enough to feather to knock at the door of the *Standard*. There is yet much variety in the lacing; in some the comb shows yet the 'pea,' and in others the Hamburg point. Some also are clean-legged. But with careful breeding they have a fair prospect of becoming one of the most valued of our domestic fowls. I trust their breeders will not *knock* until their points become so established that the fraternity shall bid them a cordial *come in*."

In November, 1877, Mr. M. L. Kidder writes in the same journal of this breed, adding the name American Sebright:

"In size they are much like Plymouth Rocks; in form they are like no other; bodies are very deep and wide, carrying a large amount of the very best quality of flesh. In color, as the name seems to indicate, the breast of the cock and the entire body of the hen much resemble the beautiful white and black of the Silver-laced Sebright Bantams, except that the lacing is broader. Hens' necks are striped like Brahmas', and they have a glossy, green-black tail, a little larger than a Brahma's. The hen has a very low, flat rose-comb. Her weight at maturity is six to eight pounds. The color of the cocks, except the breast, is much like that of the Dark Brahma; but the form is more like the Dorking. Weight, eight to eleven pounds. Both have, or should have, clean, bright yellow legs,

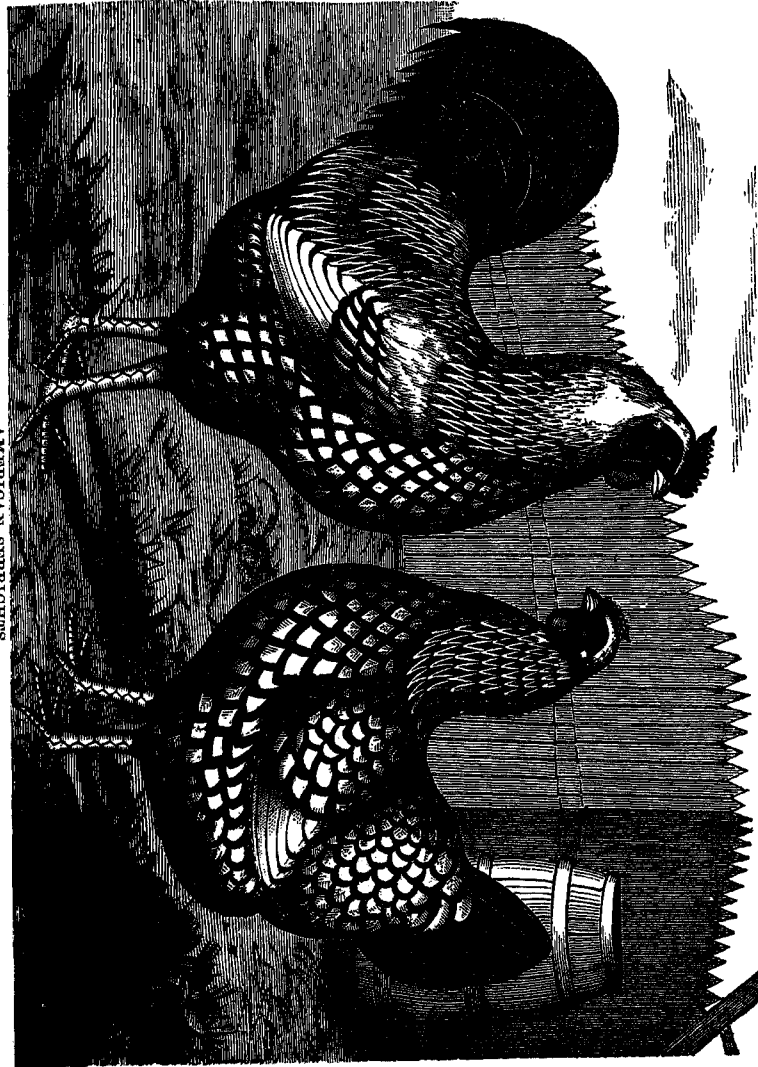
free from feathering. They are very quiet, social birds, excellent layers, sitters and mothers, without that inveterate sitting propensity of all Asiatics. The chicks feather early, grow plump at six weeks, and are prime for the table after eight weeks old. They are very hardy and healthy, and for general food qualities and purposes I have never raised their equal."

In September, 1879, Francis Soule writes in the same journal of this breed, calling it the American Sebright, as follows:

"At the last exhibition of the Massachusetts Poultry Association, held in Boston, I called the attention of two of the committee to my fowls, and asked what prospect there was of their being admitted into the *Standard*. They said they were fine birds, and the breeders of this variety should agree upon the standard. But as long as some want single combs and some rose-combs; some feathered legs and some smooth legs, they cannot agree to admit them."

Mr. Soule further proposes that breeders agree upon rose-combs and smooth, yellow legs—such fowls, in short, as are shown in our illustration, on page 145.





AMERICAN SERPENTS.

CHAPTER XV.

BANTAMS.

The Bantam fowls are simply dwarfs of the ordinary breeds, their size having been reduced by taking advantage of occasional "sports," and preserving this advantage by judicious selection and breeding.

Fowls of the diminutive size of the Bantams have been known since the time of Pliny, but the most noted breeder of Bantams as a specialty, was Sir John Sebright, who in 1800 originated the varieties now known as the *Golden* and *Silver Sebrights*, or Golden and Silver-laced Bantams.

These breeds, which are properly but modifications of one breed, differing only in the ground-color of their plumage, were originated by crossing a common Bantam with a Polish fowl, and breeding the cross thus obtained to a hen-feathered Bantam cock which Sir John accidentally found. These crosses were followed up by many years of the most careful breeding, until now the Sebrights are among the most beautiful of fowls.

The plumage of the Sebrights is of a golden ground-color in the Golden variety, or of a silvery-white color in the Silver, each feather being distinctly laced with black. In the smaller feathers of the neck and thighs this lacing produces a darker color, while in the larger feathers of the wings and tail the lighter ground-color predominates.

The Sebright cocks are completely hen-feathered, being devoid of hackle, saddle, and sickle feathers. In carriage they are very erect and proud, so much so as to remind one of the strutting of a turkey-cock—the head and tail nearly touching, and the wings nearly reaching the ground. In disposition they are very pugnacious, always ready for a battle, and not hesitating to attack much larger adversaries.

The hens are restless and active, and are fair layers, but their eggs are apt to be infertile, especially when they run with perfectly hen-feathered cocks. A very slight divergence toward cock-feathering, in the Sebright cock, either in the extension of two of the tail feathers—though but for half an inch—or in a tendency toward saddle feathers, has been found to be attended with increased fertility in the eggs; but such a tendency is discountenanced in the exhibition-pen.

The comb must be double, or rose shaped, erect, full of points, and ending in a good peak behind; the wattles are small, florid or livid in color, those of the hen, especially, being quite compact. White ear-lobes are sought after, but are difficult to obtain, and hence a red ear-lobe is not a disqualification. The legs and feet are slate-colored; and free from feathering. Twenty ounces is given by

Mr. Hewitt as the extreme weight for the Sebright cock, and sixteen ounces for the hen, but the *American Standard* allows twenty-six and twenty-four ounces respectively.

Black Bantams.—In this breed the plumage of the cock is of an iridescent black hue throughout; that of the hens a jet black. The tail is full, with well arched sickle feathers in the cock, and carried well forward towards the head. The comb is of the rose variety; the ear-lobes white; the wattles and face red; the legs short and black, or leaden-blue in color.

In the *English Standard* the Black Bantams are disqualified if the cocks weigh above twenty ounces, or the hens above eighteen ounces each, but in the *American Standard* six ounces more are allowed to each sex.

White Bantams.—In this breed the plumage is of a clear white throughout, and the legs and feet are white. White Bantams have been bred so small in England as not to reach a pound and three quarters per pair; but the English and American Standards allow the same weights as for the black breed.

The chief fault of the White Bantams is a tendency in the cocks to assume a yellowish tinge in the feathers of the shoulders and saddle. The White Bantams have rose combs and red ear-lobes.

Booted White Bantams.—Feather-legged Bantams were formerly quite common in England, but of their several varieties only the white has been retained by modern breeders. This breed has single combs, and is distinguished by the heavy feathering of the legs, which are heavily vulture-hocked; the shanks may be white or yellow, but white is preferred, and they must be feathered to the end of the outside toes.

The long vulture-hocks prevent these fowls from scratching, hence they may be kept in gardens where other fowls would do mischief. There should be no yellowish tinge in their plumage.

Pekin, or Cochín Bantams.—This singular breed of fowls, illustrated on page 151 is said to have first been brought to the notice of English fanciers at the sacking of the Summer Palace at Pekin. "During the occupation of the Palace by the British, a pair of these Bantams used to come daily into the officer's tent to be fed; and as a quantity of spoil was being collected to be sent to England these two were caught up and forwarded. This pair were the progenitors of all those since reared in England. The very close in-and-in breeding necessitated by the introduction of only a single pair has had its inevitable result in want of fertility in the eggs, and great mortality of the chickens; consequently the great drawback to these very singular little birds is the extreme difficulty of breeding them; as the chicks die in the shell, at various stages of development."*

No further description of these birds is needed than to say that they are simply miniature Buff Cochins; the color and feathering being almost the same; the difference being in the size, the standard weights for these being the same as for other Bantams.

It has been attempted to remedy the defect in constitution to which Mr. Tegetmeier refers by crossing this breed with the White Feather-legged Bantam and then breeding out the cross with results which promise to be satisfactory.

*Tegetmeier.

Japanese Bantams.—These, as our illustration shows, are among the oddities of the poultry-yard. They are of Japanese origin, as their name implies, and, with a frizzled-feathered Bantam, are the only breeds which that country has as yet furnished us. When first introduced they were of several colors, but the *Standard* has settled upon white for the body color, with black tails.

The standard weights are the same as for other Bantams; the carriage is very upright; the comb single and very large, and the wattles large and pendant. (See illustration, page 157.)

Game Bantams.—All the varieties of the Game fowl are reproduced in miniature in the form of "Game Bantams," for which no other description is necessary than to say that the *Standard* for the larger varieties is applied throughout to the Bantams, except in size, the standard weights for the latter being twenty-two ounces and twenty ounces for the cock and hen respectively.

In addition to the varieties of Bantams above described there are several others, which have at one time or other been cultivated, but which it would be unprofitable to enumerate here, as they are chiefly obsolete, or else mongrel strains not likely to be recognized as *Standard* fowls.

Bantam chicks in general are a little more sensitive to wet weather while quite young, than those of larger breeds, but after a few weeks they are equally hardy and easy to raise. The use of the Bantams is chiefly as pets, although they are in general fair layers, and probably give a fair return for the food consumed.



CHAPTER XVI.

MISCELLANEOUS BREEDS.

SULTANS.

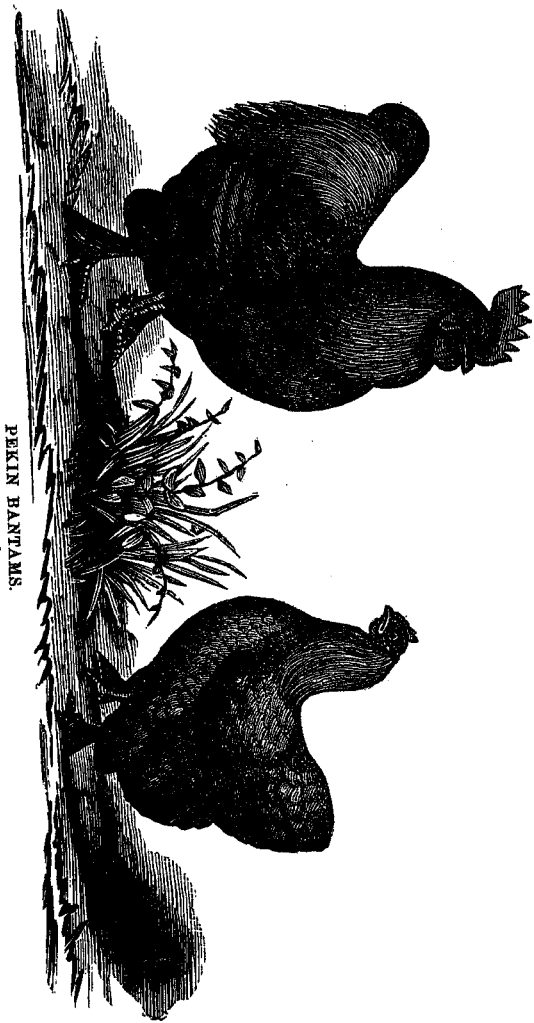
These are a diminutive white fowl, weighing from three to five pounds, heavily crested, feather-legged, and vulture-hocked. They were first imported in 1854 by a Miss Watts of Hampstead, England, from Constantinople, where they were called Serai-Laook, or Fowls of the Sultan. They seem not to have been abundant in Turkey, as Miss Watts failed to secure a second consignment. The *pure* Sultans of to-day, are therefore descendants of the original trio imported to Hampstead, and are hence not very abundant, while they have been closely in-bred. Their chief value is, like that of the Bantams, for ornament and for children's pets.

SILKIES.

The peculiarity of these fowls is that the webs of the feathers are separated, so as to give the plumage the appearance of hair, rather than of feathers. The quill feathers of the wings have the filaments so much divided as to be useless for flight, and the tail, in the best specimens, is but little more developed than that of the Cochins. The comb is usually depressed and warty, and, with the wattles, of a deep purple color. The ear-lobes are generally bright blue, the legs and feet blue, as also the skin and the periosteum, or bone covering, a fact which makes these fowls quite undesirable for the table. The plumage of the Silkies is clear white; they possess a crest, and a fifth toe, the shanks and outer toes being feathered. The carriage of the birds is rather low and Cochin-like.

The loose plumage of the Silky fowls gives them the appearance of greater weight than they possess; the hens weighing generally but two pounds, and the cocks two and a half. On account of their small size they are frequently classed with the Bantams, and they are chiefly valuable to lovers of the curious, or to those who wish to domesticate the smaller wild fowl, as quails, pheasants etc. For this purpose they are exceptionally valuable, being very docile, excellent mothers, and able, on account of their loose plumage, to brood a large number of chicks.

The Silkies have long been cultivated. We find an account of a "wooly" fowl, which was undoubtedly the Silky, in the works of Conrad von Gesner, who wrote at Zurich during the sixteenth century; and again in those of Aldrovandus, a century later.



PEKIN BANTAMS.

JAPANESE FUR FOWLS.

These are a variety of the Silky fowl, but are distinguished from that breed by having a white skin; red face, comb and wattles, the comb being of the "rose" shape; and in being heavily crested and bearded. They were first imported into the United States in 1872 by Geo. H. Carey, of New York, according to a statement in the *Poultry World* for May, 1879.

This breed is not yet recognized in the American *Standard*.

FRIZZLIES.

This name appropriately describes a breed of fowls which was described by Aldrovandus, and has been known ever since. It is stated by Temminck that this breed is widely domesticated in southern Asia, Java, Sumatra, and all the Philippine islands, and that its prevailing color is white, although there are many black and brown specimens. As bred in the United States the Frizzlies are of all colors, from white to black.

Their distinguishing peculiarity is the curious disposition of the feathers to curve forward towards the head, giving the bird the appearance of having been roughly "rubbed the wrong way."

The English writers on poultry do not give the Frizzlies a good character for constitution nor productiveness; but several American breeders speak of them as being very hardy and excellent layers; enduring the cold of winter well, and attaining an average weight of five or six pounds.

RUMPKINS.

The Rumpkins, or Rumpless Fowls, were also described by Aldrovandus, which shows them to be an old breed. The name is derived from the absence of the last vertebrae of the back, those which support the fleshy protuberance from which the tail grows, consequently the fowls are tailless. Their origin has been ascribed by Temminck to the forests of Ceylon, but this conclusion is pronounced premature by E. L. Layard, who, writing from Ceylon in 1850 to the "*Gardeners Chronicle*," says: "The Rumpless Fowl is not an inhabitant of this island. It is a rather rare, tame introduction from Cochin, I am told. It may appear like boasting, but I can confidently say I am more acquainted with the Ceylon fauna than any man living, and that if the bird had existed wild I must have seen it. *Wallikikilli* (the name given by Temminck to the supposed wild Rumpkin) "is the name for the female of *Gallus Stanleyi*, meaning literally *Walli*, jungle, and *Kikilli* hen. The name of the Rumpkin is *Chocikukullo*, literally, Cochin fowls."

Mr. Tegetmeier quotes the above with approval, and further says: "There can be no doubt that the Rumpless fowl does not exist in a wild state in any region of the Globe. It has evidently taken its rise in an accidental variation, which has been perpetuated by the care of man; its continued existence is a very good example of the perpetuation of a variety by the process of artificial selection."

Mr. Hewitt is quoted by Tegetmeier as saying with regard to these fowls:—"It is difficult to breed them to any particular color; as with the most rigid

care in the selection of the brood stock, the chickens sport into nearly every variety of marking and ground-color. The only birds of this kind that I ever knew to breed truly—so far as color was concerned—were purely white ones.

"Extraordinary differences in point of size exist in these fowls; some specimens range as heavily as six and a half to seven pounds each; others do not exceed two and a half or three pounds. Some have small lark-crests; others—and these constitute the majority—have none. As usually met with they appear to possess no distinguishing formation of comb; rosy, cupped, and flat combs being equally prevalent. There is, therefore, no positive standard that can be laid down as the peculiarities of this variety save the one to which their name refers.

"I now proceed to mention a still more perplexing proof of their versatility of character; a friend of mine purchased a successful pen at a poultry show, taking them away to a walk where no other fowls ever trespassed; and yet the chickens were, in a considerable number of instances, furnished with fully-developed tail-feathers, being not rumpless. On inquiry of the previous owner, he stated: 'Mine have always done so from the time I first kept them; but the tailed birds will very probably produce rumpless chickens.' Three such birds were then purposely retained; and they produced the next year, more than twenty youngsters, all of which, but one, were rumpless and destitute of tail feathers. The white ones I have before alluded to, occasionally produced chickens that were not rumpless, but only rarely. I believe Rumpless fowls to be hardy, as even in exposed situations, on the sides of Welsh mountains, they continue in good health and prosper well, even in cases where the fowls at all times shift for themselves, and but slight attention is shown to the chickens. I can willingly add my testimony, likewise, to the good quality of a Rumpless fowl on the dinner-table, the flesh being abundant, white, firm, and of good flavor; but, as a drawback to their utility, it may be stated that all Rumpless fowls are sadly prone to lay unfertilized eggs."

With regard to the above defect Mr. Tegetmeier states that it is purely mechanical, and may be remedied by cutting away or shortening the drooping saddle-feathers of the hens during the breeding season.

CREEPERS.

These fowls, known in Scotland as *Dumplings*, or *Scotch Bakes*, and in France as *Courtespattes*, are distinguished by their extremely short legs, the shank bones of well bred birds frequently not exceeding two inches in length, in birds weighing from five to seven pounds.

Although a good fowl, being docile, good at laying and sitting, and superior for the table, this breed is now but little cultivated. It would seem, however, to be worthy of attention as a means of reducing the tendency in some other breeds to become leggy.

BLACK RUSSIANS.

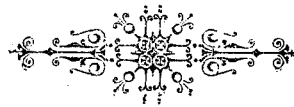
This breed, though recognized by the *Standard*, is extremely rare. It seems to have been first introduced into the United States by way of New Orleans, and to have traveled thence up the Mississippi to Iowa. It has subsequently been imported into Connecticut.

The fowls are of medium size, greenish black in color, with rose or double combs, and heavy beards, or muffs. They are round and compact in form, their flesh of good quality, and they are reported to be extraordinary layers.

GRAY LIVONIANS.

Northern Europe, from Denmark through Finland to Livonia, in northern Russia, possesses a fowl which is almost the exact counterpart of the American Dominique, but which has been originated in one of those countries.

As this fowl is greatly esteemed in those high latitudes it would seem desirable to import it into the northern United States.



CHAPTER XVII.

TURKEYS.

Naturalists at present recognize but two species of wild turkeys—the *Meleagris gallopavo*, and the *M. ocellato*. Of these the first embraces two varieties, the typical *M. gallopavo*, which is the wild turkey of the South-western United States and Mexico, and the *M. sylvestris* of Canada and the Northern United States. These varieties were formerly classed as different species, under the names of *M. Mexicana* and *M. Americana*, but as they differ but little, except in color of plumage, they have latterly been regarded as but one species.

M. ocellato is the rare and beautiful Ocellated Turkey of Central America.

In former geological epochs, at least three other species of *Meleagris* have existed within the limits of the present United States; the remains of two species, *M. Altus* or *superbus*, and *M. celer*, having been found in the Post Pliocene of New Jersey, and of another, *M. antiquus*, in the Miocene beds of Colorado.*

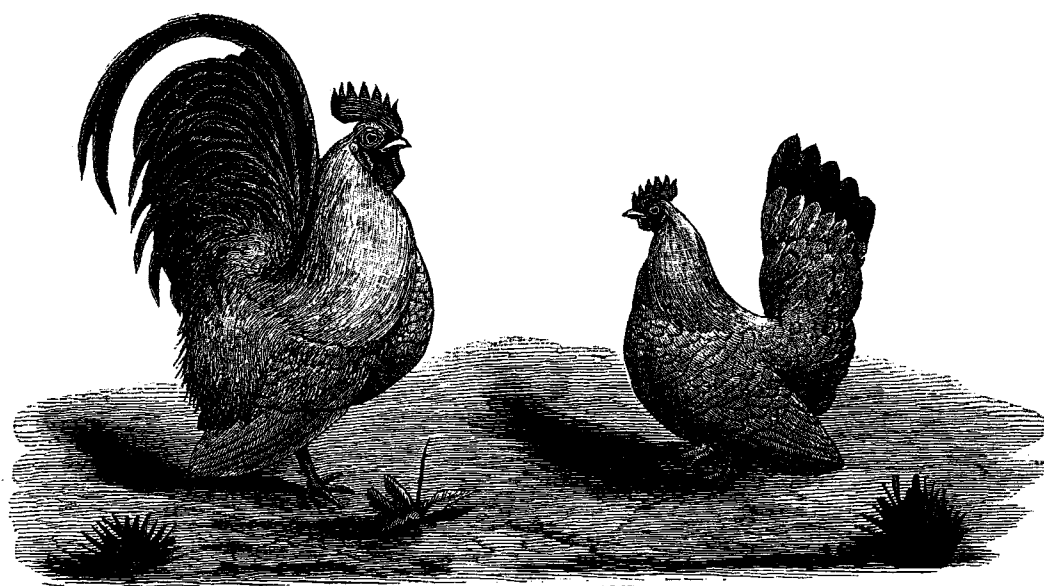
Anatomically the turkey is closely related to the Guinea fowl: Hence, the generic name, *Meleagris*, the ancient name of that fowl; while the specific name, *gallopavo*, is compounded of the names of the barn-door fowl, *Gallus*, and of the peacock, *Pavo*.

Ornithologists now generally believe that the wild turkey of Mexico was the direct parent stock of the domesticated turkey, basing this belief upon the facts that this variety shows more tendency toward the variation in the color of the plumage which characterizes the domestic fowl, as its wing coverts and tail feathers contain some white. Another argument in favor of this theory is that the species or variety existing in the vicinity of the comparatively civilized Mexicans would probably have been brought into domestication long before that whose habitat was among the roving Indians to the northward. That the turkey had been domesticated by the Mexicans is shown by the fact that it was introduced into Europe from Mexico or the West Indies by the Spaniards, early in the sixteenth century.

The following interesting historical notes were written by Prof. E. L. Sturtevant for the *National Live Stock Journal*:

"Mexico was discovered by Grigalva, in 1518. Cortez, in 1519, on the march to Cempoalla, saw the wild turkey, which is described as a species of peacock (Diaz). Peter Martyr refers to the turkey, whose "females sometimes lay twenty or thirty eggs;" and Clavigero and Oviedo also notice this bird. At Cibola, New Mexico, in 1540, Coronado found "certain guinea cocks, but few," and kept by the natives for their feathers; but he found them "excellent good,

*Prof. Theodore Gill, in Johnson's Cyclopædia
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JAPANESE BANTAMS.

and greater than those of Mexico." Antonio de Espago, 1583, speaks of them as "hens of the country." Benzoni, 1572, says they are only found "in the territories of Guatemala, of Cape Fonduri, and Mexico;" that they have been brought to Europe, and that this species of peacock is commonly called the Indian fowl.

"This noble bird, says Prescott, was introduced into Europe from Mexico. The Spaniards called it *gallopavo*, from its resemblance to the peacock. Baird says it is reported to have been introduced into England in 1541, and in 1573 had become the Christmas fare of the farmers. In 1526 it had already been transported in a domestic state to the Antilles.

"There can, however, be no question of the fact that the turkey was habitually reared by the Mexicans at the time of the conquest. Bancroft furnishes references which carry its domestication beyond the Mexicans of Montezuma's time, for in the splendid zoological gardens of that emperor, 500 turkeys were daily killed for food for the birds of prey. One of the chief offerings of the Zapotecs was the blood of the, to them, sacred turkey. The Nahuas kept and bred turkeys, quails, geese, ducks, and many other birds. In ancient Yucatan, the Maya Nahuas had domesticated turkeys, ducks, geese, and other fowl.

"The American turkey, *M. gallopavo* (L), is a native of North America, from Mexico to the forests of Lower Canada, but has not been found wild west of the Rocky Mountains. We have noticed that Coronado, in New Mexico, found, tamed by the Indians, a turkey "greater" than those of Mexico. Watson, in his annals, says precisely, that "the Swedes on the Delaware tamed the wild turkey. The Indians also tamed the turkeys and kept them near their huts." Thus, although we are willing to believe with Baird, that the *M. Mexicana* furnished the first one eaten in France, served at a banquet given at the wedding of Charles IX., in 1570, we deem it equally reasonable to believe that some of our present birds, at least, trace their origin to the *M. Gallopavo*.* Perhaps it is to this latter strain we are to assign those varieties which attain great size and weight, such as the one sent by Mrs. Lounesbury, of Connecticut, in 1866, to President Johnson, which, not quite two years old, weighed above 47 lbs.; or the still larger one killed by A. Johnson, of Pulaski, Ky., which, according to sworn statement, weighed 55 lbs. A slate-colored bird, exhibited at the Paris Exhibition, weighed 43 lbs. Now Josselyn refers to wild turkeys in Massachusetts which, when pulled and dressed, weighed 30 lbs.; Wood calls for an extreme weight, 40 lbs.; and when William Penn settled Philadelphia, the wild turkeys were said to be so large and fat as to sometimes weigh 46 lbs. Mr. Audubon records a weight of 32 lbs.

"The American Standard of Excellence, for use in judging, disqualifies Bronze turkeys where the adults do not weigh 25 lbs. and 16 lbs. for the cock and hen respectively; Narragansett turkeys must weigh 25 lbs. and 15 lbs.; White turkeys, 20 lbs. and 12 lbs.; Black turkeys, 20 lbs. and 12 lbs.; Buff turkeys, 20 lbs. and 12 lbs.; Slate turkeys, 20 lbs and 12 lbs.

"The turkey was at one time almost feral on the banks of the Parana (Darwin).

*It will be noticed that Sturtevant gives the name *gallopavo* to the variety named *syvestris* by Gill. It would seem more proper to give the name *gallopavo* only to the variety to which Linnæus originally applied it, which was, doubtless, that of Mexico.—ED.

Was observed feral by Clarke in Circassia, in 1800. At Trebizond the turkeys abound (Curzon).

"We see that six varieties are recognized in America. Darwin mentions four in England, and a Buff-yellow breed, formerly in Holland, with an ample white topknot; and Mr. Wilmot describes a White turkey cock with a crest. F. Michaux, in 1802, suspected that the common turkey had not descended from one species alone, and even believed that English and French turkeys differed, from having different proportions of the two parent forms."

Prof. Spencer F. Baird, in his work on the birds of North America, supports the hypothesis that, in addition to the wild species above named, there originally existed another species, which was the original of our domestic bird; that this species was indigenous to the West India Islands, where it was tamed, and then transplanted to Mexico, and from thence to Europe in 1520; and that ultimately the wild original was exterminated by the natives; which hypothesis would explain the fact of our finding no wild turkeys at the present day which closely resemble the domestic breeds.

This view, however, is not generally entertained by other naturalists. Charles Darwin, in referring to it, says:

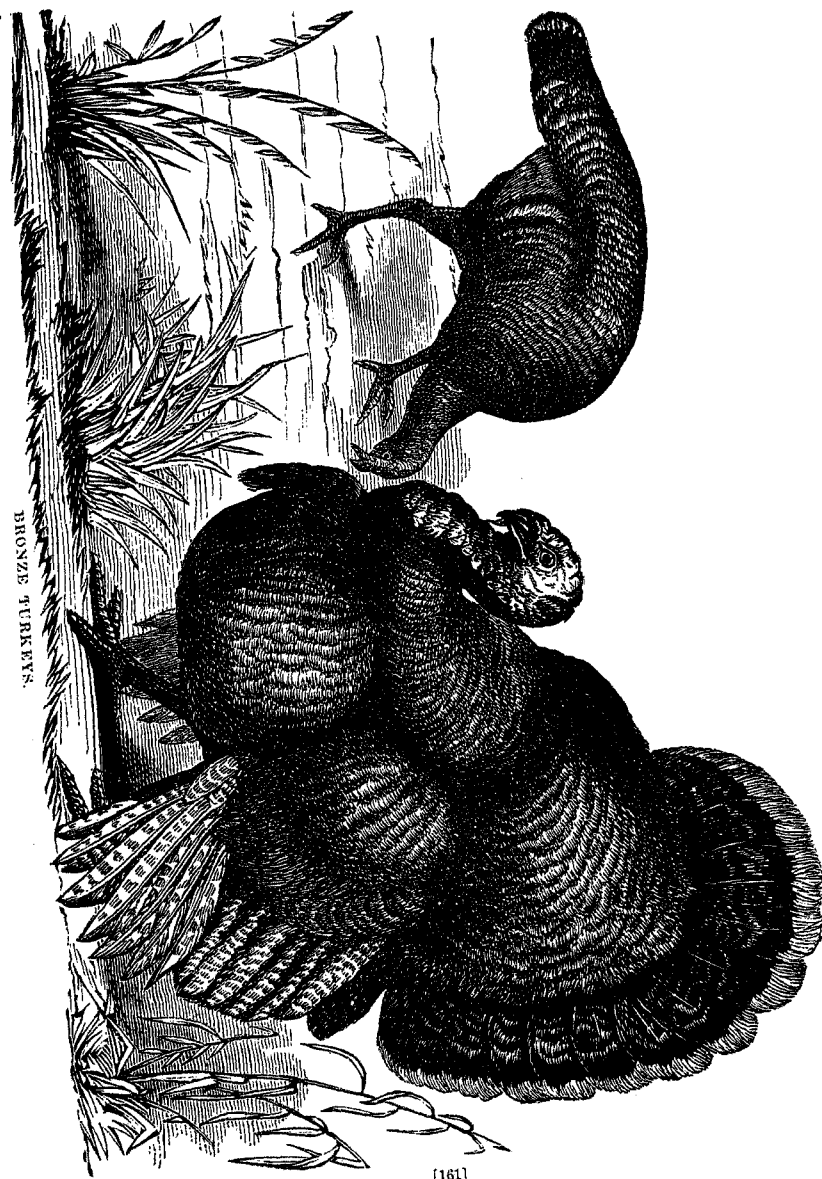
"But, besides the improbability of a bird having long ago become extinct in these large and luxuriant islands, it appears that the turkey degenerates in India, and this fact indicates that it was not aboriginally an inhabitant of the lowlands of the tropics."

The North American wild turkey is thus described by Mr. Elliot:

"When full-grown, the male will measure four feet in length and nearly five feet in the stretch of its wings. The naked skin of the head and neck is blue, with the wattles red, as are also the legs. The feathers of the neck and body generally are a coppery bronze, changing in some lights to a greenish or purplish shade, and margined with an opaque line of velvet black. The back and rump are also black, and tipped with a light chestnut. Near the end of the tail is a band of black, broadest on the outer feathers, and narrowing as it approaches the central ones. Between the bars on the feathers is a confused sprinkling of black. Neither upon the tail or its coverts is there any white, and this is one of the means by which the wild bird can always be distinguished from the domesticated. From the centre of the breast hangs a long, coarse, hairy tuft, sometimes not found in the other sex. The female differs from the male principally in being smaller in size, less brilliant in coloring, and in the absence of the spur, and of the flesh process at the base of the bill.

The following interesting account of the habits of the wild turkey was written by Captain Flack, a noted sportsman and traveler:

"The wild turkey cock is never seen fairly but in the forest. The war-horse described by Job, and the sorriest hack on Hampstead Heath, when his Sunday troubles are over, would scarcely present a greater contrast than does the wild bird to the tame; nothing alive shows more points of health and purity of blood than does this fine bird. His clean, game head is fully four feet from the ground, and his bright, hazel eyes are full of intelligence and suspicion—so different from the dull expression of the tame bird. His great breadth of shoulder, deep chest, and clean, firm step must strike the most superficial ob-



server. The general tints of the gobbler—for he is a far handsomer bird than the hen, and generally twice the latter's size—are purple and a deep, rich brown, with various shades of gold and violet colors gleaming upon his close-lying plumage as the sunlight plays upon its surface. The head and neck, when bare of feathers, are of a darker blue than in the tame variety, whilst the tuft, resembling horsehair, which hangs from the breast, often measures, in full-grown males, nearly a foot.

"If the weather is mild and warm towards the end of February, the forests, just before and at daybreak, are filled with the gobblings of the cocks and the responsive cluckings of the hens; and this continues through March and April. By the close of the latter month the clucking has almost entirely ceased, as the hens are upon their nests, which they keep carefully concealed from the gobblers. These latter, at this time, worn out with their amorous duties and battles with their rivals, are nearly mute; and now, having nothing to fight about, and being weak and thin, wander about by themselves through the summer, too worthless for powder and shot. So poor are they that they have given rise to an Indian proverb, 'As poor as a turkey in summer.'

"The hen generally makes her nest some two or three hundred yards from the edge of the forest, in the prairie, and never very far from water, to which, being a thirsty bird, she makes about three visits a day—in the morning, at noon and in the evening. Prairie sloughs, which run out some distance from the main timber into the prairies, and which have some little timber upon them, are favorite nesting-places, as she can steal from the forest, under the shelter of the straggling timber, undetected by the gobblers, gain her nest on the prairie, and sit in peace; as the gobblers at this time, poverty-stricken and ashamed of themselves, seek the thickest parts of the woods to hide in, and rarely venture into the open. But, poor or fat, whenever the cock finds a nest he breaks it up, and he never neglects to break the skulls of all the young chicks he comes across.

"The chicks, when hatched, are very small, and covered with a more hairy covering than the down which young chickens have. If the season be a dry one they thrive very fast, as insect food is abundant; but whenever it is a wet season the young ones 'fare but middling,' as they are particularly tender, and are easily killed by damp, chilly weather. Upon the dryness of the season, therefore, the turkey-hunter builds his hopes of the plentifulness of his game.

"By October the young birds have become nearly grown, and able to take care of themselves; the hens have recovered the flesh which they had lost by sitting, whilst leading their young in pursuit of the myriads of grasshoppers which swarm on a southern prairie during the summer; and the gobblers having picked up their good condition by feeding upon wild grapes, blackberries, mulberries, nuts, grubs, and the thousand-and-one treasures scattered through the forest; and so, all feeling strong and fat, they gradually join their forces and form 'gangs' as the backwoodsmen call them, often consisting of a hundred individuals or more in each gang. From this 'gathering of the clans,' October is named the 'Turkey month' by the Indians.

"At this season the turkeys wander over a great extent of country in search of 'mast,' remaining in one place only so long as the acorns, pecan-nuts, and other food remain plentiful; and when these are exhausted they move on in

search of more, rarely rising unless they have a river to cross, or are flushed by a hunter's dog, or by wolves, foxes, wild cats, etc. When the river to be crossed is a very wide one, such as the Mississippi, they often spend a day or two upon its banks, as though considering the difficulties of the attempt. During this time the males strut backwards and forwards, their 'fans' expanded, their wings sweeping the ground, and their throats rolling out gobble after gobble in quick succession, as though trying to inspire the hens and young birds with courage for the undertaking. Finally, when the courage of all has been wound up to the proper pitch, the whole flock flies up into the tops of the highest trees, where they sit a short time longer, stretching their necks out towards the bank they desire to gain, as though estimating the distance to be crossed, as well as gathering breath for the prolonged flight. At last, seemingly at a given signal, all take wing; but in their progress across there is always a descent, and few except the strongest ever land much beyond the bank, the younger and feebler often falling into the water—not always to perish, for they can swim a little—but many frequently gain the bank exhausted and bedraggled, only to fall a prey to wolves or wild cats, which, warned by the two or three days' gobbling on the opposite bank, are on the look-out for 'wrecks'. Very often the backwoods squatter also profits by the flight, for, having heard the noise, he prepares to secure a few to lard down in a barrel for future consumption at his wigwam. Judging, from former flights, where the 'gang' will make his side of the stream, he lies concealed, and when the flight does take place he takes advantage of the birds' necessities, and secures 'a right smart chance of 'em.'

"From October to February the turkeys remain, in larger or smaller companies, together; when, as before stated, the preparations for breeding commence.

"The wild turkey, as an object of pursuit, is the shyest and most wary of all game; even where they are plentiful and rarely hunted, the person who pursues them must have some knowledge of the bird and its habits to hope for success. When they are scarce, and have been much hunted, they become inconceivably wild and suspicious, and only the veteran hunter can kill them; young, half, or three-quarters grown birds are more easily killed."

The Mexican wild turkey, *M. Gallopavo*, as described by Mr. Gould, is considerably larger than the variety found farther north, "but it has shorter legs, a considerably larger and more expanded tail, conspicuously toned with black and brown, and terminated with white; the tail coverts are very profusely developed, largely tipped with white, and bounded, posteriorly, with a narrow line of black, their basal portions being rich metallic bronze. The same arrangement of coloring also prevails in the feathers of the lower part of the flanks, and on the under tail coverts, where it is particularly fine. The centre of the back is black, with green, purplish, and red reflections; the back of the neck, upper part of the back, and shoulders, are in some light bronzy, in others the color of fire; the greater wing coverts are uniform bronzy brown, forming a conspicuous band across the wing; all the primaries are crossed by mottled bars of blackish brown and white, freckled with brown; all the under surface is fiery copper, intensely brilliant in certain lights, and becoming darker towards the flanks."

The Ocellated, or Honduras turkey, is thus described by Mr. Tegetmeier:

"The Ocellated turkey is a native of Guatemala, the province of Peten and Yucatan."



GUINEA COCK.

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tan. The extraordinary brilliancy of its plumage renders it almost equal in beauty of coloring to the Impeyan Pheasant, which scarcely surpasses it in the metallic lustre of the feathers. In size it is nearly equal to the common turkey. At the base of the upper mandible of the bill is a long, fleshy caruncle, capable of contraction and dilation as the bird is excited or tranquil. The head and part of the neck are naked, and of similar livid color, but without those caruncles or fleshy tubercles on the lower part which are so characteristic of the common species. On the breast, the tuft of coarse hair, that forms so characteristic a feature in the common turkey is absent.

"The feathers of the upper part of the body are mostly of a brilliant bronzed green, terminated by two bands; the first black, and that next the tip of a golden-bronze color. Lower down the back the colors become more vivid, and are tinted with emerald green, rich blue, or red, according as the light falls upon them. On the tail the bars or bands become broader and even more brilliant, making each feather appear as if eyed or ocellated; and, from the arrangement of the tail coverts there appear four rows of these brilliant metallic eyes. The upper wing coverts are a rich, bright chestnut, which contrasts strongly with the white of the feathers of the lower part of the wing.

"The entire plumage may be described as far more brilliant, varied, and beautiful than that of any other turkey. The general appearance of the bird differs widely from that of the domestic species. Several hybrids between this and the ordinary species exist, and these have proved perfectly fertile, breeding freely in domestication."

DOMESTIC BREEDS OF TURKEYS.

The original varieties of domestic turkeys were but two, the Norfolk, or black, and the Cambridge, or variegated. These varieties have latterly, however, been elaborated into a larger number, by the skill of modern breeders in fixing certain characteristics of color, until we have one or two varieties of white turkeys, of which the *White Holland* is a very large, fine bird; the contrast of colors between the red neck, the black tuft or beard, and the snow-white plumage being very beautiful. The buff color often seen in the common turkey has also been fixed in a separate breed. Rhode Island has produced a large breed called the *Narragansett*, the prevailing colors being a mixture of black and white, and also an equally large dove or slate colored breed; and within a few years a new, larger, and very fine variety called the *Bronze* turkey has been originated by crossing with the wild *M. sylvestris*.

At several times since the domestication of the turkey, birds with crests similar to those of the Polish fowl have appeared, but no breeder has yet been able to fix this peculiarity so that it will be uniformly reproduced.

THE BRONZE TURKEY.

We quote from the *American Agriculturist* the following remarks upon this splendid breed:

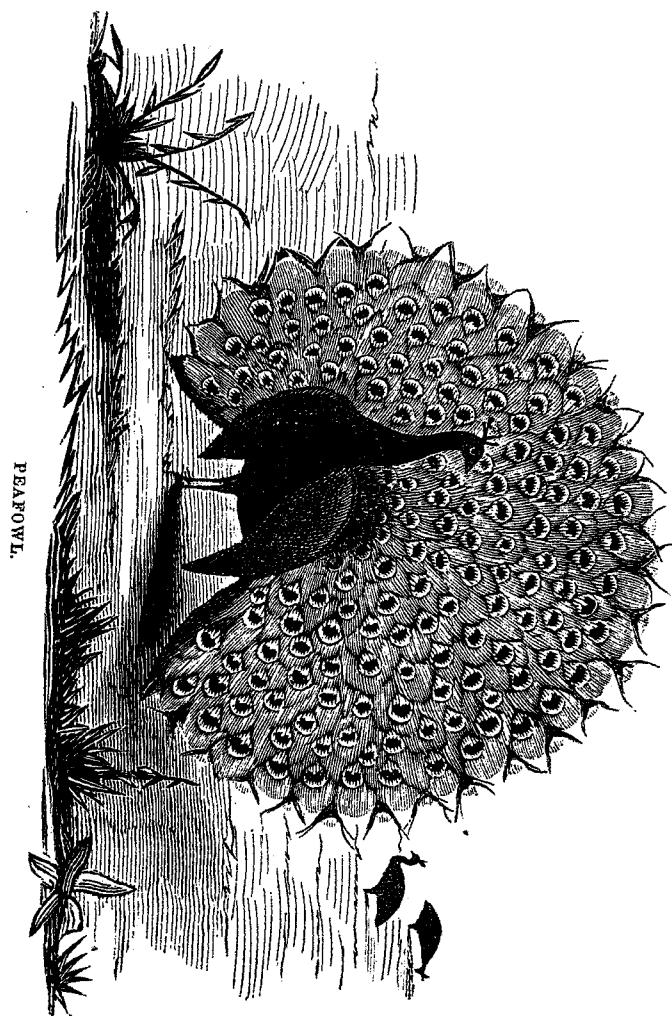
"All things considered, we place the Bronze turkey at the head of all the breeds of this domesticated bird. The white, buff, black, slate, and other varieties, all

come from the wild turkey of our woods and prairies, which still exists in considerable numbers in the newer states and territories. Occasional specimens of the wild bird, generally old gobblers, are captured, which equal the heaviest weights of the farm-yard, but the average of the wild birds is much lighter than the average of a well-bred farm flock. The Bronze breed is the smallest departure from the wild bird in respect to color, and a decided improvement upon it, both in color and size. Nothing can exceed the brilliant plumage of a Bronze cock-turkey, in his second or third year, and the females are hardly less attractive. The dirty, snuff color, which marks the wild birds, is entirely bred out of them. This lustre of the plumage, assimilating to that of burnished gold in the sunlight, has made the Bronze variety a great favorite with all admirers of fine poultry. About everything known to the arts of the breeder has been done for the Bronze turkey to bring the stock to its highest perfection. They are the Short-horns of the poultry-yard. They have been bred especially for size for a long time, and when we select stock from a flock of thoroughbred birds, we have certain qualities fixed in them, which are reproduced in their offspring. They are uniformly beautiful in plumage, and heavier than birds raised from the common stock. The increased cost of breeding stock is paid for in the larger average weight of the turkeys slaughtered for the markets at Thanksgiving and Christmas. The standard weights for adult birds of the Bronze variety, fixed by the American Poultry Association, are, for males, twenty-five pounds; for females, sixteen pounds; but these weights, in well-bred flocks are often reached in the first year, and adult pairs of forty-five to fifty pounds are not uncommon, and sixty to sixty-five pounds are sometimes, though rarely, reached. It pays to breed invariably from the best stock." (See illustration, page 161.)

MANAGEMENT OF TURKEYS.

The following full directions for the management of turkeys were written by a correspondent of the *Country Gentleman*:

"Comparatively few farmers who raise turkeys, make suitable preparations for the business. These birds are recently reclaimed from the forest by the frequent infusion of new wild blood, and it is taken for granted that they are capable of taking care of themselves, and the more freedom they have the better it is for them. This is one of the half truths that does a great damage in the rearing of the crop. They have no yard for them, often no roosts, and they are left to seek their own nests, and to brood in the woods, where they are exposed to foxes and other predaceous beasts, and birds of prey. It is not uncommon for the hen turkey to steal her nest in the woods, and to hatch out her brood without the knowledge of her owner. While it is true that these birds need a ramble through the summer, when they can get the most of their living in green pastures, it is also true that they need restraint during the laying and hatching season, and for the first three weeks after the chicks leave the nest. None of our domestic birds are more susceptible of training, or take more kindly to the preparations that the wise poultryman makes for their thrift and comfort. During the laying and hatching season, they want a good deal of attention, and for a part of the day, at least, should be kept in a yard or orchard by themselves, where nests



PEAFOWL.

have been prepared for them, and where they can be regularly fed and inspected.

"The success of the year depends very much upon your knowing where every bird is, where she spends the day and especially where she lays and where she is brooding. If you have failed to make their nests in the yard or building prepared for them, it is best to leave the bird to finish her litter in the nest she has selected. A few days after she has begun to brood, remove her to a secure place in the yard or shed where you want her to sit. Put a coop over the nest, with moveable slats in front, so that she can be fastened on her nest and let out at pleasure, and put a few addled or artificial eggs in the nest until the bird gets wonted to her new quarters. Remove her from her old nest at night and fasten her upon her new nest, and keep her caged for three or four days. She will not suffer in that time for want of food or water. Remove the board from the front of the coop, and watch for her first coming off, about the middle of a pleasant day. You may have to drive her back and cage her for a few times, but she will soon accept her new quarters, and sit as quietly as the other hens near her. It may require some painstaking and watching to effect the change of base, but it can always be accomplished.

"It sometimes happens, in the process of incubation, that eggs are broken by the hen as she turns them over to equalize the heat. Her instinct leads her to remove the broken egg and to keep her nest clean; but she cannot always keep the raw egg from the shells of the remaining eggs. This matter should be looked after every day when the hens come from their nests, for the albumen and yolk will stop the pores of the live eggs and kill them. While the turkey is off, wash off the fouled eggs with warm water, wipe them clean, and after putting in some clean hay, put the eggs carefully back again into the nest. This is a frequent cause of failure in the hatching of the eggs, and should have careful attention. If the turkeys have had plenty of broken oyster or clam shells during the laying season, or have been fed with a little lime mixed in the dough, they will generally make thick-shelled eggs and escape this trouble. It saves a great deal of time in watching for this and other causes of damage while the hens are brooding, to have the nests all in one yard, or near to one another. Generally the sitting hens will come off about the same time of day, and it will take but a few minutes at this time to examine every nest, and ascertain if any eggs have been broken and everything is going on satisfactorily.

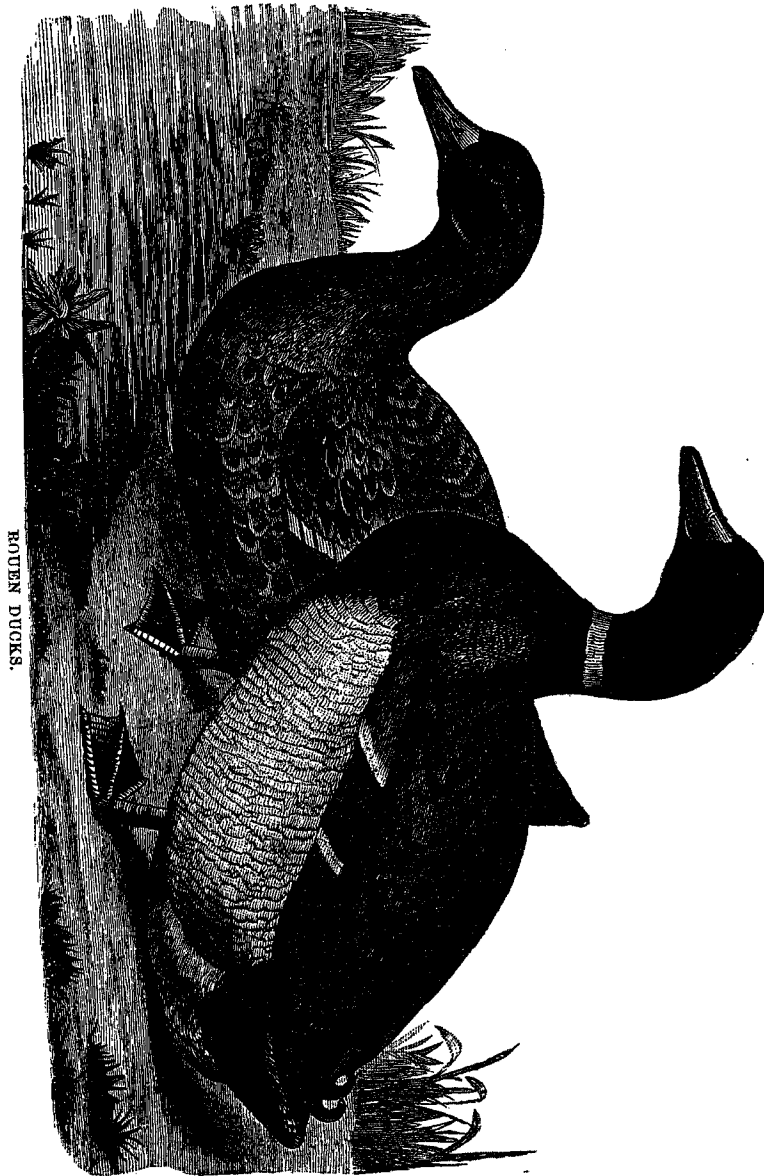
"The period of incubation lasts thirty days, and on the thirty-first you may listen for the evidence of new life in the nest. The old bird is expecting the advent, and answers the first peep from the broken shell with a soft, tremulous sound, expressing her anxious emotions. This touching and plaintive note, so expressive of maternal sympathy, is continued as the chicks one after another break out of their shells, and thrust their heads into her soft feathers for warmth and protection. If the incubation has gone on prosperously, they will all break the shell within a few hours of each other. If the mother bird has been used to your presence, there will be no difficulty in approaching the nest at this time and examining the chicks. Generally nothing needs to be done but to remove the shells, and this the hen will often attend to herself. The chief damage at this time is from the stepping of the bird upon the chicks;

but if they come out strong, they are generally safer in the nest than elsewhere. If any are removed from the nest to the house for safe keeping, they should be restored to the mother again at night. They need no food for the first day after hatching, and you only need to feed the hen while she remains upon the nest.

"If the weather is favorable, they should be removed from the nest on the day following the hatching, or when the last chick is a day old. If the turkey is gentle, you can take the most of the brood from under the hen and put them in a basket before she will move. If she is uneasy and likely to flutter, and injure the young, catch her first by the legs, and catch the chicks afterwards. To guard against lice, wash the old turkey on the underside of the wings and on the body with a strong decoction of tobacco. This will do no harm if she is free from vermin, and will be sure to kill them, if she has them. If the young turkeys get lousy, put on ointment made of yellow snuff and grease, on the under side of the wings and naked parts of the body. An ounce of prevention is worth a pound of cure in this case. If they are drooping and act sleepy you may know there is trouble. Yard them immediately. Examine every bird, and apply the snuff ointment. You cannot expect to raise a large flock of turkeys without careful attention to little things. It is a good plan to mix a little sulphur with the dough occasionally, which is distasteful to the parasites that infest them.

"When first taken off, the chicks should be confined, while the mother has her liberty. I have never found anything better for this period of their lives than a pen made of boards a foot wide, twelve or fourteen feet in length, and set up edgewise in the form of a triangle. A short board laid across the corners will make a good shelter in case of rain. The hen may be left at liberty. She will not go far from her brood, and it will be several days before they will be strong enough to get over the top of the board fence. Set a shallow pan in the yard, and see that it is supplied with fresh water every morning, and with a dough made of coarse ground Indian meal, fine chopped boiled eggs and new milk, or other suitable food. They do not want a great deal of food, but want it often after they begin to eat. They may be kept confined in this yard for two or three days, then taken out for a few days after the dew is off in pleasant weather, and returned again before night. If any of the chicks are wet, and need more hovering than the old bird gives them, they may be wrapped in cotton or wool and put in a basket under a stove or near the kitchen fire, or what is better, put under a sitting dunghill fowl for a few hours.

"The natural instinct of the turkey leads her to wander about in search of food for her young. This is a necessity for herself and for her brood, and the habit of roaming should be encouraged as soon as the chicks are able to bear it. For the first month they should not be out of sight of the attendant for more than an hour at a time, except at night, and then he should know where she broods her flock and where to find her in the morning. If the old birds are inclined to wander too far, or into the mowing and grain fields, tie a shingle across the wings of the old ones, with the string close to the body, so that they cannot fly. Then if your fences are in good order they can be kept in place about as readily as sheep or pigs. This will not interfere with their covering their young at



night, or during showers. After two months they will get the larger part of their food for themselves, and should be encouraged to visit the more distant pastures and woodlands of the farm. After a light feed in the morning drive them afield, where grasshoppers and other insects are plenty.

"It is quite essential to the best success in raising turkeys, that some one person in the family should have charge of the birds from the time that they begin to lay until they are ready for slaughter in the fall or winter. A little boy or girl, an aged person past hard work, or a trusty servant, having this for the chief part of his duty, should be the watchman. Where a dozen hen turkeys are kept, it will pay for this minute supervision. To be sure, a good many turkeys are raised under very careless management, but a great many more that are hatched, and generally the larger part, are lost for want of timely attention. Heavy dews, tall grass, stormy days, dogs, foxes, hawks, crows, and other creatures, are enemies that need to be guarded against. The attendant should know where every clutch is for three weeks after hatching, during every hour of the day, and where the roost is. As they grow older, more liberty may be allowed, but they should be taught to come home to the one roost prepared for them early every evening. Turkeys have lively memories of their feeding places, and if they are fed regularly about four o'clock in the afternoon, which is the last meal the old birds or half-grown young should have, they will be seen or heard wending their way home from all parts of the farm, in good season for the evening meal, giving time for counting, and for looking up the stragglers, if any are missing. If the owner of the flock holds the attendant to strict accountability for watching and counting every night, and occasionally counts himself, to see that the reckoning is right, he will save a good many turkeys in the course of a season.

"By setting the turkeys in groups of two, three or four at a time, and near each other, they will all come off at the same time, and learn to keep company together, and to feed in the flocks through the summer. It is much better to have several groups or herds feeding separately, than to have all the turkeys on the farm feeding in one flock, or scattering promiscuously in all directions. They will gather more food, thrive better and require much less time in looking after them.

"Among the worst enemies of the young turkeys after they begin to ramble, are the tall grass and grain crops. While the hen gets on well enough, the young get tired, sit down, and the mother bird is soon out of hearing. The chick struggles on for a time, but soon perishes for want of food and hovering. As a rule, the flocks of careless managers suffer more from this cause than all others combined. They drop off one by one, especially on cold, foggy days, and the loss is so gradual that it is hardly noticed without daily counting. The flocks must be kept out of the mowing fields, the oats, rye and barley. Unless this be done, success with this crop will be very small. Turkeys do not succeed so well upon the prairies, and upon rich bottom lands, mainly from this cause. They succeed well in New England, and in the dairy regions where there are extensive pastures, with hilly or well drained soils. They have more turkeys to the square acre in Rhode Island and Eastern Connecticut, because this region abounds in dry, gravelly loams, pastures with short feed, and oak and chestnut

forests, which furnish a large amount of food. The owners of rather poor farms with a large share of huckleberry pasture, can be thankful that they have a first-rate chance to enlarge the poultry crop, and make money.

"Food for Young Turkeys.—There is a good deal of nonsense published in the books about the feeding of young turkeys, and the flocks later in life. The simple fact is that this bird is a voracious feeder, to which hardly anything in the list of animal and vegetable diet comes amiss. The principal need of caution in the few days after hatching is in the direction of overfeeding. They want very little, and want it often, and nothing should be left upon the feeding-board or run to grow sour, or to become mixed with the excrement before the next feeding. Some tell us to plunge the chicks into cold water, to make them hardy. A worse thing could hardly be done. Others say, make them 'swallow a whole peppercorn,' which is about as indigestible as a bullet. Others advise to give them a little 'ale, beer or wine,' taking counsel of their own perverted appetites. The turkey craves a mixed diet of grain and animal food from the start, and this can be supplied in a great variety of forms. Most farmers, especially on dairy farms, have the best food for them close at hand. The best staple food is Indian corn, ground coarse, mixed with new milk. Add to this a hard-boiled egg, chopped up fine, and you have a complete food for young turkeys. A pint of meal to one egg, with milk enough to just moisten it, is a good mixture for the first few days. Then chopped onion tops and grass, or cabbage, may be added. The old ones will eat of this dough, but cannot get it all. The chick will be able to get crumbs enough to meet its wants. Boiled liver is a good substitute for eggs. As they grow older, chopped raw meat, or fish, may be given. Milk is always in order, and among the best foods for the growing birds all through the season.

"One of the most successful turkey-raisers that I know of, robs the pigs to give sour and skimmed milk to his turkeys through the summer. He has a long trough, into which the milk is poured every morning, and the turkeys have all they can drink. There is generally enough left in the trough to entice them back from their rambles at an early hour to the roost. He frequently raises two hundred turkeys in a season, and never has a failure of the crop. Indian corn is the best food for the half-grown and adult birds, and they never seem to get tired of it. All kinds of grain are keenly relished, and it is well to give an occasional feed of oats, buckwheat, wheat or barley, for change of diet. As the fattening season approaches, along in October, many farmers feed with a mixture of boiled potatoes and Indian meal, or oats and corn ground together. This is given warm every morning, and where pigs are fed it is a very convenient preparation. But there is probably nothing more economical than corn, as the staple food through the year. Young turkeys should not be fed after five o'clock in the afternoon. Instinct does not teach them to feed at night. If they have a good range in summer, they will return from their rambles with their crops full of insects, and all they want is a safe roost, and time to digest what they have eaten. Any kind of cheap animal food, given occasionally, will help their growth in seasons or places where insects are not abundant. One of the cheapest of these is boiled beef scraps, or mutton scraps, from the butcher's. This comes in cakes, and costs about a cent a pound. Fruit and vegeta-



bles, cooked or raw, are wholesome diet and easily procured, and make a good change of food. A valuable outfit in raising turkeys is a bed of cracked oyster shells, or clam shells, where the birds can help themselves, which will be often. If you put a barrel or two in the road, the hoofs of horses and the wheels of vehicles will do the crushing without cost.

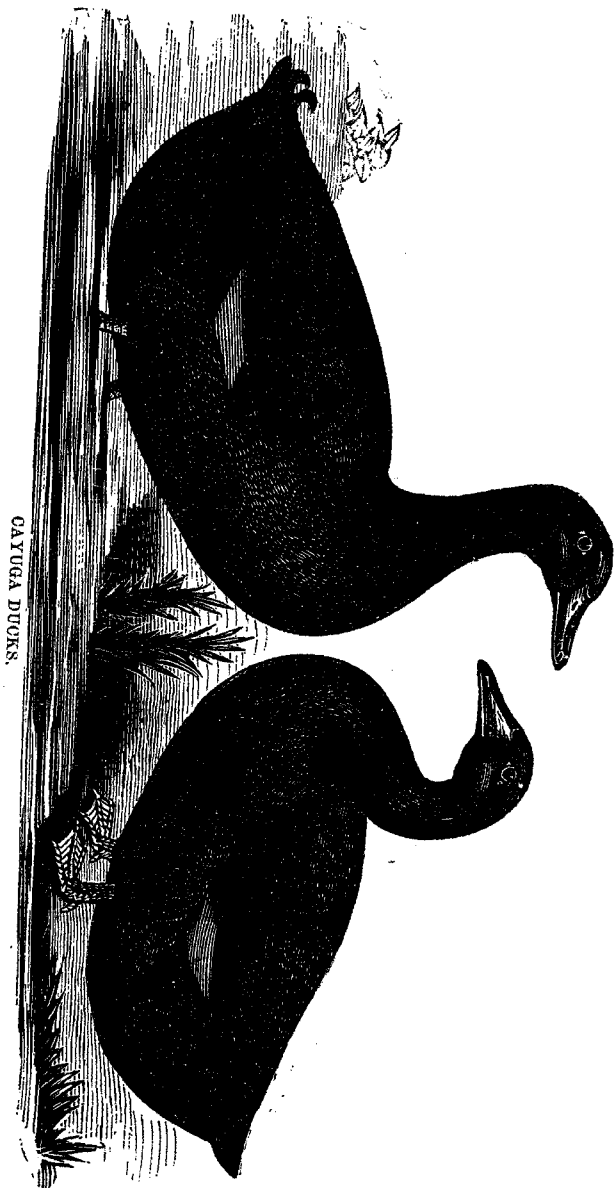
"Shelter for the Young Turkeys.—If you mean business in raising this crop, see that the hen and her brood are safely housed every night for a month at least after hatching. A vacant stable, or shed, or barn-floor, or hovel, furnishes suitable shelter, and with little trouble after the habit is established. The prime object of this shelter is to guard the young against water and other enemies. Showers often come up in the night and drench the mother bird, and if she attempts to move, some of the young will be drowned. Then, in the open field, they are exposed to skunks, foxes and weasels, and sometimes to thieves in human shape, who can bag your birds at midnight and remove them to unknown parts. Then the young chicks that roost on the ground for the first month, are more likely to have straight breast bones than those that take to the roost and balance their bodies on a fence rail, or the small limb of a tree. The birds get accustomed to go into the barn and other buildings, and it is much less trouble to yard them in the fall or winter, when you want to sell them for stock or for slaughter.

"Marking the Turkeys.—Turkeys are taxable property in Connecticut, and the owner is liable for damages done by them in this State, and this ought to be the case in all the States. A man should be able to identify his turkeys as readily as his sheep, for they are more likely to stray and to do damage to growing crops. As a matter of convenience, it is well for near neighbors to breed turkeys of different colors, so that each owner can distinguish his own at sight, and keep them within bounds. It will save a good many steps in the course of the year. Colors have been established by our popular breeders, so that there is rarely a sport of strange feather in a flock of hundreds. The Bronze type is only a short remove from the wild turkey, and the plumage is as uniform from one generation to another as that of the original stock. So we have black, white, buff, slate and other colors, which are propagated with great uniformity. It is not difficult at all for neighbors to agree upon breeding different colors, so that every man will know his own birds as far as he can distinguish colors. A convenient time to do the marking is in the fall when you select birds for breeding, which should be the heaviest and most perfect birds of the flock. Some sew upon the right leg a strip of leather about an inch wide, leaving it loose so that it will slip up and down readily, and leave room for growth. Some use a strip of cloth of a given color, as their turkey mark. Some cut off one of the toe nails when they are chicks, or when the birds are selected for breeding. Enter your mark in your poultry-book, so that it may be available for reference in case of dispute or litigation. It may save a good deal of trouble and hard feeling among neighbors. You should be able to swear to your own property, and to keep your birds upon your own land. An ounce of prevention is worth a pound of cure in neighborhood quarrels.

"Many turkeys die off very suddenly by carelessly leaving salt in their way. Sometimes the old brine is turned out from meat or fish barrels. Sometimes it

is left upon rocks, or in troughs, where cattle and sheep are salted in the pastures. I notice that along the sea-board, where it is not the custom to salt cattle, turkeys succeed much better than they do farther back. This may be one reason of the large reputation of Rhode-Island turkeys. The whole State is exposed to the sea air, and the pastures where the birds ramble are free from salt licks. Put your refuse salt where the turkeys cannot find it.

"How to Fatten Turkeys.—Nothing pays better to be sent to market in prime condition than the turkey crop. Many farmers do not understand this. Their turkeys grow on a limited range, get little or no food at home through the summer, and if fed at all with regularity, it is only for two or three weeks before killing. I see these lean, bony carcasses in the local markets every winter, and feel sorry for the owner's loss. They have received a small price for their birds, and a still poorer price for the food fed out. The average life of a turkey is only seven months, and the true economy of feeding is to give the chicks all they can digest from the shell to the slaughter. If they get all they can eat on the range that is well. Usually this should be supplemented by regular rations when they come from the roost in the morning, and two or three hours before they go to roost at night. The food may be slack in the morning, so that they will go to the range with good appetites, and fuller at night. They should be put upon a regular course of fattening food as early as the middle of October, when you purpose to kill the best birds at Thanksgiving. The younger and lighter birds should be reserved for the Christmas and New-Year's markets. They continue growing quite rapidly until mid-winter, and you will be well paid for the longer feeding. There is nothing better for fattening than old corn, fed partly in the kernel and partly in cooked meal mashed up with boiled potatoes. Feed three times a day, giving the warm meal in the morning, and feeding in troughs with plenty of room, so that all the flock may have a fair chance. Northern corn has more oil in it than southern, and is worth more for turkey food. Use milk in fattening if you keep a dairy farm. Feed only so much as they will eat up clean. Cultivate the acquaintance of your turkeys as you feed them. No more charming sight greets your vision in the whole circle of the year than a large flock of bronze turkeys coming at call from their roosts on a frosty November morning. New corn is apt to make the bowels loose, and this should be guarded against. There is usually green food enough in the fields to meet their wants in the fall, and cabbage and turnips need not be added until winter sets in. If the bowels get loose give them scalded milk, which will generally correct the evil. Well-fattened and well-dressed turkeys will bring two or three cents a pound more than the lean birds. It will not only be better for the purse, but for your manhood, to send nothing but finished products to the market."



CHAPTER XVIII.
GUINEA-FOWLS AND PEAFOWLS.

THE GUINEA-FOWL.

The Guinea-fowls are natives of Africa and Madagascar, where they are found under nine or ten species, constituting the genus *Numida*, which, with the allied genera *Agelastes* and *Phasidus*, each represented by one species, make up the family *Numididae*.

The genus *Numida* is sub-divided into three groups, of which one has a bone casque upon the head; a second has a crest or plume of feathers in the place of the casque, and the third, comprising but one species, is destitute of either casque or crest, and is called the Vulturine Guinea-fowl, from the vulture-like appearance of its head.

The domesticated Guinea-fowl owes its origin to the first group, and to either the species *Numida meleagris* or *N. ptiloryncha*, or both. *N. meleagris* inhabits the west coast of Africa, from the Gambia to the Gaboon, whence it has been imported into the Cape Verde islands, and also into some of the West Indies, where it is now found wild, and is sometimes extremely troublesome to farmers from its propensity to scratch up and eat the seed corn, peas etc., and the yams and cocoas.

Abyssinia, Kordossan and Sennar, are inhabited by *N. ptiloryncha*, which is distinguished from *N. Meleagris* by having a blue face and wattles, and a tuft of stiff, white bristles at the base of the upper mandible. Darwin was inclined to regard this species as the true origin of the domesticated fowl,* but in this he is disputed by other naturalists.

It seems that the Guinea-fowl was in domestication during the time of Columella, since he described two varieties of fowls corresponding to *N. meleagris* and *N. ptiloryncha*, but we have no record of it after his time until since the introduction of the turkey, or about the middle of the sixteenth century, when it was described by Gesner.

The *Vulturine Guinea-fowl* has never been domesticated; but we learn that efforts are now being made to introduce it into England with a view to adding it to the attractions of the poultry-yard.

The ordinary Guinea-fowl retains much of its wild nature in domestication, in common with its cousins, the turkey and the peafowl. It will seldom roost in the fowl-house, preferring the lower branches of trees; the hen is very skillful in hiding her nest; and the young birds after they are a few weeks old, thrive best to be allowed ample range.

In the natural state it seems probable that the Guinea-fowl was monogamous;

* Animals and Plants under Domestication—*I.*, p. 294.
[183]

at any rate it is best to have a larger proportion of males than is necessary with chickens, although instances are on record where the eggs laid by eight or nine hens running with but one cock proved generally fertile. The hens are great layers of rather small, pointed, brown eggs; a flock of nine hens being reported by a correspondent of the *American Cultivator* as having averaged one hundred and twenty-two eggs each for one season. They frequently do not sit until late in the season, and a whole flock will lay in the same nest if opportunity offers. We have taken forty eggs from a single nest, which a pair of Guinea-hens had hidden in a field of oats.

The period of incubation is twenty-six to twenty-eight days, the eggs are most advantageously hatched under a small Game or Bantam hen, and the young chicks should have, for the first few weeks, the same treatment recommended for young turkeys, except that it is imperative that they be frequently fed—they require food oftener than any other young fowls.

The Guinea-fowl is not a popular bird, on account of its harsh and incessant noise, which begins early in the morning, and is continued until night without intermission. To those who can endure its racket, however, it offers some points of value, being a persistent insect-catcher, a good layer, giving flesh of a gamey flavor much relished by some, and being so easily disturbed at night that when it can be induced to roost near the fowl-house it serves as an excellent hen-thief alarm.

The tendency of the domesticated Guinea-fowl to produce albinos has resulted in the production of a white breed, with several intermediate shades.

The Guinea-cocks resemble the hens so closely that it is difficult for an inexperienced person to distinguish them; the cocks are a little larger, have larger wattles, and utter a shriller cry—that of the hen resembling the words "come back, come back!"—the cocks also frequently assume a pugnacious attitude, which the hen never does.

The loose plumage of this bird makes it appear larger than it really is, its usual weight being four to five pounds. The general appearance of the Guinea-cock is well shown by the accompanying illustration. (See illustration, page 165.)

The Guinea-fowl has been known to produce sports having the peculiar tassel on the breast of the turkey, thus lending support to the doctrine of the evolution of the present forms of animals and plants from, at most a few, normal types.

THE PEAFOWL.

This most gorgeous of all birds is a native of Asia, being now found wild throughout Southern Asia and the Malay archipelago. Naturally, on account of its great beauty, it would be among the first birds brought into domestication, and we find it mentioned in the history of the times of Solomon (I. Kings x. 22), and also by the writers of Greece and Rome. Two species of Peafowl are now recognized: the common Peafowl, *Pavo cristatus*, and the Javan Peafowl, *P. muticus*.

The following description of the common Peafowl, given by Wright, is probably as good as can be given, but no word-description, nor even an uncolored engraving, such as the excellent one on page 169, can convey any adequate idea of its gorgeousness:

"The head, neck and breast of the male are a rich, dark purple, with beautiful blue reflections, the head having an aigrette, or crest, composed of twenty-four feathers, which are only webbed at the tip, where they show blue and green reflections. The back is green, with a copper colored lacing to the feathers; the wings whitish, striped or barred with black, gradually shading into deep blue. The primaries and true tail feathers are a dark, rich chestnut; but the tail coverts, or train, are glossy-green, ocellated at the tips. The thighs are generally grayish, and the belly and rump black. The eyes are dark hazel, pearled round the edges, and legs brown, spurred as in the common fowl. The neck is very long, slender and snaky, and the head small in proportion to the body. The Peahen is much more subdued in color, being of a prevailing chestnut brown, variously shaded on different parts of the body, and mottled or shaded in places, especially about the wings and tail, with a dull or grayish white. She has a crest like the male, but duller in color, and not so tall."

The wild nature of the Peafowl has never been wholly eradicated, hence it never thrives in close confinement, but must have considerable range, as over a large lawn, park, or country place. It can scarcely be induced to roost in a house, preferring trees, and tall ones at that. The hen lays but few eggs, and these only in the most secluded places; she incubates them four weeks, and must not be disturbed during that time; her broods are usually small, and thrive best when left chiefly to their own management; she goes with her brood about six months, and this seems necessary, as they do not thrive when reared by common hens, which desert them at two or three months.

The young Peacock differs but little from the hen until about eighteen months old, when he begins to assume his splendid train, which he does not fully gain until his third year. This train is shed annually, and forms a considerable item in the profitableness of the birds, as it is worth several dollars for feather-brush making. A lady who is thoroughly experienced in the management of Peafowls says:

"They require no care when they are young, as the hens hide their nests, and do not bring the little ones near the house until they are about as large as quails. The greatest objection to them is that they are troublesome about teasing young chickens, but a good dog will make this all right, as they are very much afraid of dogs."

The Peafowl, like the Guinea fowl and the turkey gobbler, is a noisy bird; and its shrill "ee-aw; ee-aw," may be heard for a mile or more when the wind is favorable.

The *Burman* or *Javan Peafowl*, *Pavo muticus*, is a native of the Burmese and Malay countries, as far northward as Aracan and Sumatra, and is abundant all over Java. It is described by a writer in the *London Field* as being a finer and larger species than the common Peafowl, the neck being more bulky than in the common bird, and the plumage on it laminated, or scale-like. "In other respects the form resembles that of the common species except in the crest, which is long and narrow, standing vertically on the upper part of the occiput, and composed of narrow feathers, scantily webbed basally, and ending in oblong blades. Each of the long, flowing, upper tail coverts ends in an ocellum, or eye, colored similarly to those in the train of the ordinary Peafowl; but the longest

or last of these coverts have the terminal portion emarginate, or crescent-shaped, as if the ocelli had been cut out. The lateral or outermost of these coverts are more thickly webbed, and curved inwards, so as to bend over the adjoining ones; they terminate in points, without ocelli."

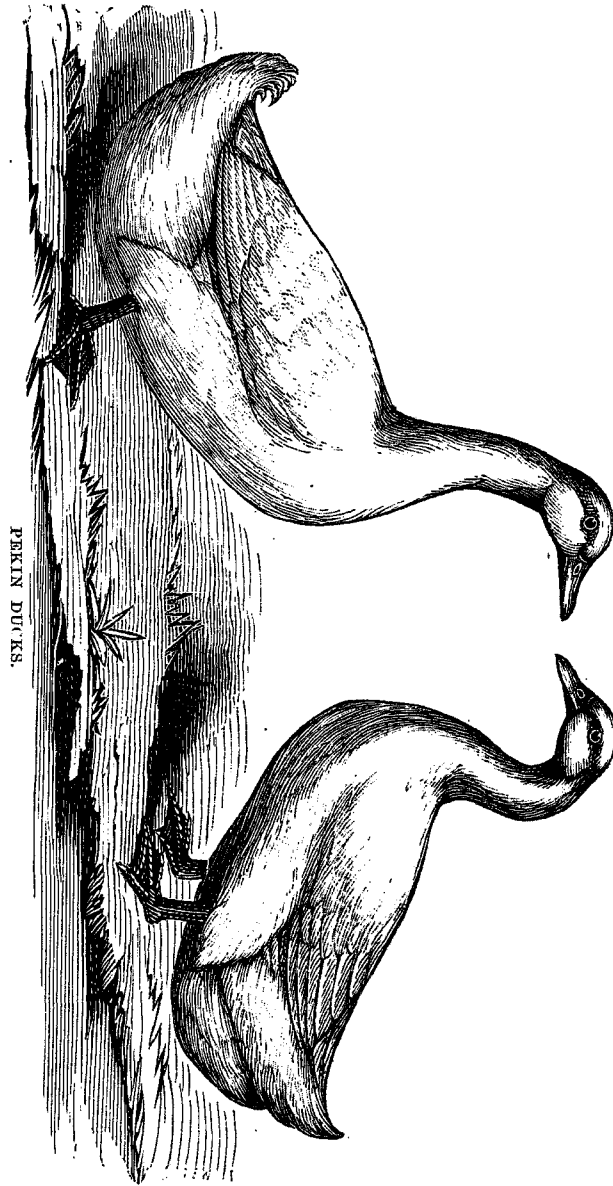
In color this bird differs from the common Peafowl chiefly in having a greater predominance of greenish shades, hence it is called the "Green Peafowl." Its habits are very similar to those of the common bird, except that it is more of a forest bird, is wilder, and more difficult to domesticate.

Some naturalists have claimed that another species of Peafowl existed in the *Black Winged Peafowl*, which they have named *Pavo nigripennis*. "In this bird the metallic green of the back, which forms the centre of the train, when extended, is more of a golden hue than in the common species, and the whole of the secondaries, scapulars, and wing-coverts are black, with narrow edges of green, which become bluish towards the carpal joint; in this particular it resembles the Javan Peafowl, and is very distinct from the common species, in which all these feathers are cream-colored, crossed with black markings. Again, the thighs of the Black Winged Peafowl are black, as in the Javan species, whereas in the common breed they are always of a pale drab.

"The female of the Black Winged species is of a much lighter coloring than the common Peahen, being almost entirely of a pale cream-color, mottled with dark coloring above, and is readily recognizable at first sight. In this respect the Black Winged is not intermediate between the two species, since the female of the Javan is much more like the male."*

The question whether this bird is a different species from the common Peafowl is open to serious doubt, as Darwin quotes numerous instances of birds of this description appearing among English flocks, and this in cases where there has been no known opportunity for crossing; moreover, no such breed is known to exist in the wild state hence we are led to the conclusion that the Black Winged Peafowl is but a variation from the normal type, just as are the pied and white Peafowls which are occasionally found.

* Tegetmeier.



CHAPTER XIX.

DUCKS.

The varieties of the domestic duck are believed by naturalists to have all descended from the common Wild Duck, or Mallard, *Anas boschas*, of the sub-family *Anatina*, and family *Anatidæ*, which latter embraces also the *Cygninæ* or Swans, the *Anserinæ* or Geese, the *Fugerlinæ* or Sea-Ducks, the *Erismaturinæ* or Spring-tailed Ducks, and the *Merginæ* or Mergansers.

The *Anatinæ* include a number of genera besides the Mallards, one of which is represented by the Wood-Duck (*Aix sponsa*); another by the Mandarin-Duck, which has been domesticated in China; and another by the Musk-Duck (*Cairina*), of South America, which has also been domesticated, and in that condition will produce fertile hybrids with the common duck.

The Mallard, however, is by far the most important species, being the most plentiful—probably out-numbering all the others—the most widely distributed, and, consequently, the best known. It inhabits the whole of the northern hemisphere; going, in the winter, as far south as Panama, Egypt and India, and in the summer retreating to Greenland, Iceland and Siberia. It usually breeds in the more northern regions, although its nests are occasionally found in the British Islands. It sometimes makes its nests in close proximity to water, but they are frequently found at a considerable distance inland, under the shelter of a thicket, or even in a hole in a tree.

During incubation the duck plucks a portion of the down from her breast, with which she surrounds her eggs, drawing it over them as a coverlet when she makes her daily excursions for food and water. When the ducklings are hatched she manages in some unknown way to get them to water. Some think she does this by carrying them in her bill, after the manner of a cat moving her kittens, but this has not yet been satisfactorily established. When in the water the ducklings have few enemies to encounter, although they are sometimes captured by pike and other voracious fishes.

The duck continues her care of the young throughout the summer, a task in which she is not assisted by the drake, as towards the end of May he goes into an additional moult, during which he loses his gay plumage and his power of flight, becoming of the same dull color as his mate. This condition lasts for several weeks, his gay attire only being resumed when his quill-feathers have grown out sufficiently to give him the ability to fly.

The markings of the Mallard drake are given as follows by Macgillivray, a writer on British ornithology:

“The common wild duck, or Mallard, if not the most elegantly formed, is cer-
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tainly one of the most beautifully-colored species of its family. The plumage is dense and elastic, on the head and neck short and splendent; the feathers of the forehead stiffish; of the cheeks and throat short, linear, slightly rounded; of the rest of the neck shortish and very soft; on its lower anterior part large, firm and glossy; on the rest of the lower parts full and blended; on the upper parts firmer. The wings are of moderate length and acute; the primaries are narrow and tapering, the second quill longest, the first scarcely a quarter of an inch shorter; the secondaries are a little incurvate, obliquely rounded, the inner elongated, very broad, acuminate. The tail is short, much rounded, of sixteen broad, acuminate feathers, and four medial, incumbent, recurvate reduplicate.

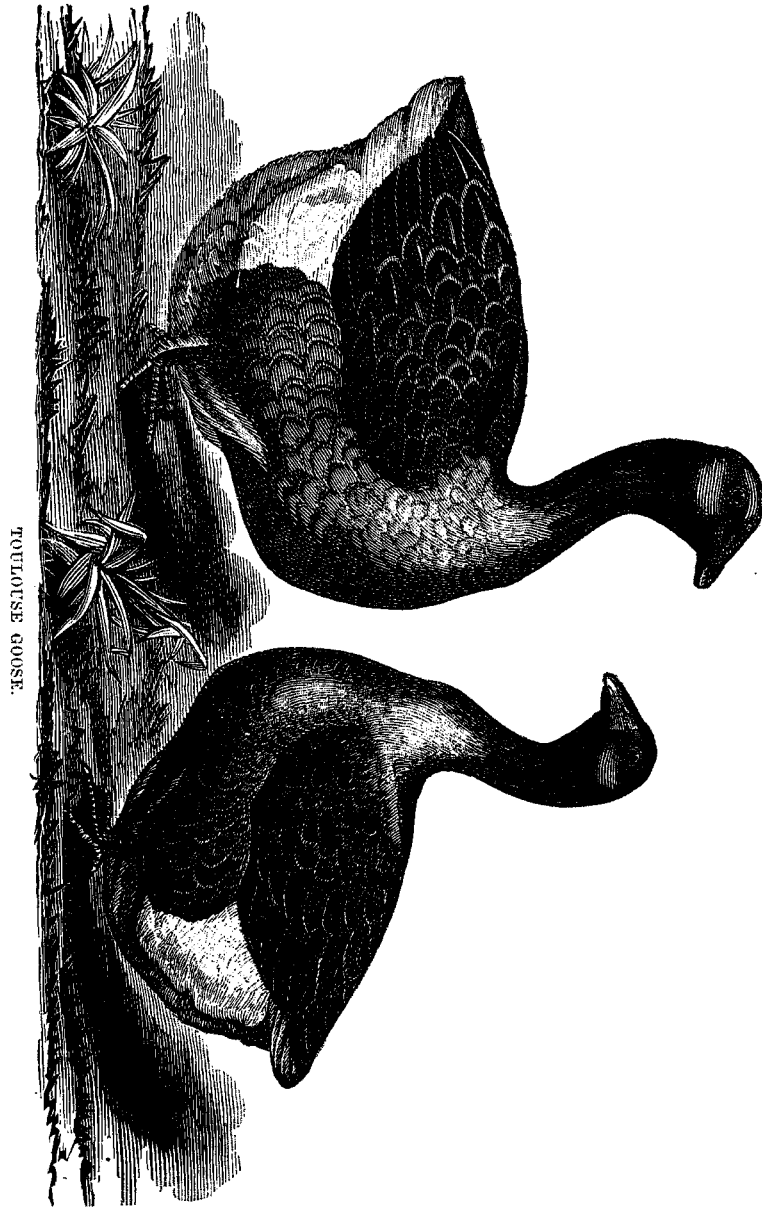
"The bill is greenish-yellow, darker towards the end, with the unguis deep brown; the lower mandible reddish-yellow, brown at the end. The iris is brown, the feet are reddish-orange, the membranes pale, reddish-brown, the claws deep reddish-brown. The forehead is blackish-green, the head and upper neck vivid deep green, changing to deep violet. On the middle of the neck is a ring of white, not quite complete behind. The lower neck and a small part of the breast are a very deep chestnut, or purplish-brown. The anterior part of the back is yellowish-brown, tinged with gray; the scapulars gray, very minutely barred with brown; the hind part of the back brownish-black, the rump deep green, as are the four recurved feathers of the tail, the rest being brownish-gray, broadly edged with white. The wing coverts are brownish-gray, as are the primary quills and coverts. The secondary coverts, excepting the inner, are white in the middle, with a terminal band of velvet black. About ten of the secondary quills have their outer webs brilliant deep green, changing to purplish-blue, with a black bar at the end, succeeded by white. The outer edges of the inner secondaries are deep purplish-brown, the rest gray, minutely undulated with darker. The breast, sides, abdomen, and tibial feathers are grayish-white, very minutely undulated with dark gray; the feathers under the tail are black, glossed with blue; the axillars and lower wing coverts are white. Length, to end of tail, 24 inches; extent of wings, 35; wing, from flexure, 11; tail, $4\frac{1}{4}$; bill, along the ridge, 2; greatest breadth, 1; tarsus, 1 5-6.

"The female is considerably smaller, and very differently colored. The bill is greenish-gray, darker towards the base; the plumage of the upper parts dusky-brown, the feathers edged with pale, reddish-brown; the throat whitish; the lower parts yellowish-gray, faintly streaked and spotted with brown; the speculum as in the male; the middle tail feathers straight. Length to the end of tail, 20 inches; extent of wings, 32.

"The females renew their plumage annually in autumn, as do the males; but the latter undergo a singular change in summer, which is thus described by Mr. Waterton:

"About the 24th of May the breast and back of the drake exhibit the first appearance of a change of color. In a few days after this the curled feathers above the tail drop out, and gray feathers begin to appear among the lovely green plumage which surrounds the eyes. Every succeeding day now brings marks of rapid change.

"By the 23d of June scarcely one green feather is to be seen on the head and neck of the bird. By the 6th of July every feather of the former brilliant



TOUTLOISE GOOSE.

plumage has disappeared, and the male has received a garb like that of the female, though of a somewhat darker tint. In the early part of August this new plumage begins to drop off gradually, and by the 10th of October the drake will appear again in all his rich magnificence of dress, than which scarcely anything throughout the whole wide field of nature can be seen more lovely or better arranged to charm the eye of man.

"I enclosed two male birds in a coop from the middle of May to the middle of October, and saw them every day during the whole of their captivity. Perhaps the moulting in other individuals may vary a little with regard to time. Thus we may say that once every year, for a very short period, the drake goes, as it were, into an eclipse, so that, from the early part of the month of July to about the first week in August, neither in the poultry-yards of civilized man, nor through the vast expanse of nature's wildest range, can there be found a drake in that plumage which, at all other seasons of the year, is so remarkably splendid and diversified."

We have no trustworthy history of the earliest domestication of the duck, but it doubtless occurred in ancient times. There are now numerous domesticated varieties, varying in plumage from white to black. One of the most curious results of domestication is that the drake, which in the wild state is strictly monogamous, becomes freely polygamous.

The wild Mallards are easily tamed, if taken when very young, but it requires many generations to breed out all their wild habits; this has been done in the case of the common duck by adding to their weight through abundant supplies of food, so that flight becomes more difficult. In confinement they will breed freely with the tame ducks, the hybrids thus produced being monogamous.

This fertility of the hybrids is one proof of the common origin of the Mallard and the domestic duck; another is found in the fact that purely bred wild ducks have shown, when bred in domestication, a marked tendency toward variation. Thus Mr. Teebay states that he has had a strain of white ducks to appear among some wild ducks which he was breeding, and this strain had reproduced itself at the time of his writing.*

THE WOOD DUCK OR SUMMER DUCK.

This duck, *Aix sponsa* of the naturalists, sometimes, though improperly, called the Carolina duck, is found throughout the greater part of North America, being a permanent resident of the warmer regions, and a summer migrant to the northward. It is the most beautiful of waterfowl, except its cousin, the Mandarin duck, and on this account has been bred in domestication, although not for a sufficient length of time to overcome its wild propensities.

In the natural state the Wood Duck makes its nest in the woods—hence its name—in the hollow of a tree, overhanging the water if possible. Its eggs are smaller than a hen's and have surfaces like polished ivory.†

The drake is about nineteen or twenty inches long, with a green head, glossed with purple and surmounted with a pendant crest or plume of green, bronze and velvet; the upper part of the throat is white; the breast chestnut; the sides

*Tegetmeier. †Gill.

yellowish, banded with black; the lower parts nearly white; the wings and tail have black, white, purple and blue in bands, spots and shadings. The plumage of the ducks is not so showy, and from June to September the drake is more plainly attired.

THE MANDARIN DUCK.

This duck, *Aix galericulata*, is a native of China. In plumage it considerably resembles the American Wood duck; but it has, in addition to the flowing crest, a peculiar shaped wing, which rises over the back in the form of a lady's fan, from which it also receives the name of the Fan-winged duck.

The Mandarin duck is domesticated in China, and attempts have been made to introduce it into America, through the public parks of New York and the Zoological Garden at Fairmount, Philadelphia.

In disposition it is very timid, and in size about like the Teal.

THE ROUEN DUCK.

The name of this duck is supposed to be a corruption of the word roan, since the origin of the breed has no connection with the city of Rouen, as its name would indicate, while the word roan, or gray, would well describe its color. The Rouen duck is simply the wild Mallard domesticated, and enlarged during the process of domestication; the coloring of its plumage being almost identical with that of the Mallard, so nearly so, in fact, that "the markings of the wild species are considered as the criteria of perfection by the judges and fanciers of the present day,"* while the interbreeding of the Rouen and the Mallard has no effect upon the markings of the former, and its size returns after the third or fourth cross.

Rouen ducks have, like Toulouse geese, an abdominal protuberance, which sometimes becomes so developed in over-fat specimens as to drag upon the ground, to the detriment of the feathers.

They are very hardy, dull and lethargic in their movements, caring little for water except to drink. They reach a large size, weighing eighteen to nineteen pounds to the pair. As egg producers they are excellent, laying a large number of large, thick-shelled eggs, which should average three ounces and a half in weight. (See illustration, page 173.)

THE AYLESBURY DUCK.

This is a large breed, weighing seventeen to eighteen pounds to the pair; in color both sexes are pure white, with broad, pale flesh-colored bills, which should not show any dark marks or stains.

Aylesburys, if well fed, are good layers; the eggs laid by the best strains being pure white. They are inclined to become over-fat, in which condition both sexes are sterile.

These ducks are largely reared and fattened for the London markets by the farmers of the neighborhood of Aylesbury; being sent to market, when properly

*Tegetmeier.

managed, at eight to ten weeks of age. By careful feeding they may be induced to begin laying by Christmas, when their eggs are set under hens, and the ducklings kept rapidly growing until ready for market.

MUSCOVY DUCKS.

Muscovy ducks are of two varieties—the white and the colored; the former being pure white, the latter blue-black, more or less broken with white feathers. The name Muscovy is a corruption of the term musk, this term referring to the musk-like odor of the skin, which odor is dissipated, however, in cooking. These ducks exist in the wild state in South America, belonging to the genus *Cairina*, previously referred to, and are also domesticated there to a considerable extent.

The drake weighs ten to eleven pounds, and differs from the drakes of Mallard origin in having a large head, and bare, scarlet-colored cheeks, the base of the bill being carunculated with the same color; in the feathers at the back of the head being re-curved, as if having been rubbed the wrong way; and in the long, straight-feathered tail.

The duck is much smaller than the drake, weighing but five to seven pounds. They have the same bare head of the drakes, but in other respects differ less from ordinary ducks.

Muscovies are capable of sustaining themselves for a long time in flight, hence they are difficult to confine; while the drakes are extremely quarrelsome, being as ugly in disposition as in appearance. The ducks are but moderate layers, and their flesh is only palatable when young, so that they are not a desirable breed to cultivate, under ordinary circumstances. (See illustration, page 177.)

THE CURL-CRESTED DALMATIAN DUCK.

This duck is descended from the Muscovy, through one parent at least, and is distinguished by a crest of intensely black, curled feathers. It also has the naked cheeks, the difference in size between the sexes, and the long tail, destitute of curled feathers of the Muscovy; while it is more quiet in disposition, and fonder of foraging in the water, a better layer, and more easily fattened than that breed.

These ducks are reared in large numbers in Dalmatia and the adjacent islands of the Adriatic, but have not yet been introduced into this country.

THE CAYUGA BLACK DUCK.

This fine breed is American, and is supposed to have originated in the neighborhood of Cayuga Lake, New York, by a cross between the wild black, or Buenos Ayres duck, and the Mallard. This supposition may, or may not be correct, as the breed has been cultivated many years, and all definite trace of its origin is lost.

The characteristic markings of the Cayuga duck are a black color throughout, except a narrow white collar around the neck, and white flecks in the breast, which latter tend to increase with age, and are avoided by breeders as much as

possible. Both ducks and drakes have a greenish tinge about the head—this being brighter in the drake, and both show a slight tendency toward a brownish tinge in the plumage.

The Cayugas are very hardy, nearly as large as the Rouens (weighing sixteen to seventeen pounds to the pair), good layers, and easily fattened. They are very quiet in their habits, and a fence a foot high will turn them. They commence laying by the end of March, and lay fifty to ninety eggs before desiring to sit. They are good sitters, but careless mothers, hens being for these, as for most other ducklings, the best mothers. (See illustration, page 181.)

THE PEKIN DUCK.

This, the largest of all known breeds of ducks, was first imported from Pekin, China, by Mr. James E. Palmer, of Stonington, Connecticut, and landed in New York on the 14th day of March, 1873.

In color the Pekins are clear white, with a faint yellowish tinge to the lower feathers, which are very thick and downy. The wings are short, hence the birds are easily confined. They are very hardy, and care little for water except for drinking. They are exceptionally large layers, the pair first imported laying over one hundred and twenty-five eggs each, during the first season, notwithstanding the exhaustion attendant upon their importation, which was fatal to the larger part of the lot originally shipped from Pekin, while during the next season one of this same pair laid one hundred and eighty-seven eggs, and the other nearly as many, and one of the early hatched ducklings began laying in August.

The recurved feather in the tail of the drake is, in addition to the difference in voice—that of the duck being much coarser—the distinguishing mark of the sexes, and also shows that the Pekin belongs to the Mallard family of ducks.

A second importation of these ducks has been made by Mr. Palmer, by which it is hoped to stop the deterioration of this fine breed through in-breeding. Only judicious crossing, combined with intelligent selection, will maintain its present superiority. (See illustration, page 187.)

THE CRESTED WHITE DUCK.

This variety is remarkable for the large tuft of feathers on top of the head, resembling the crest of Polish fowls. In some cases this crest attains a diameter of three inches.

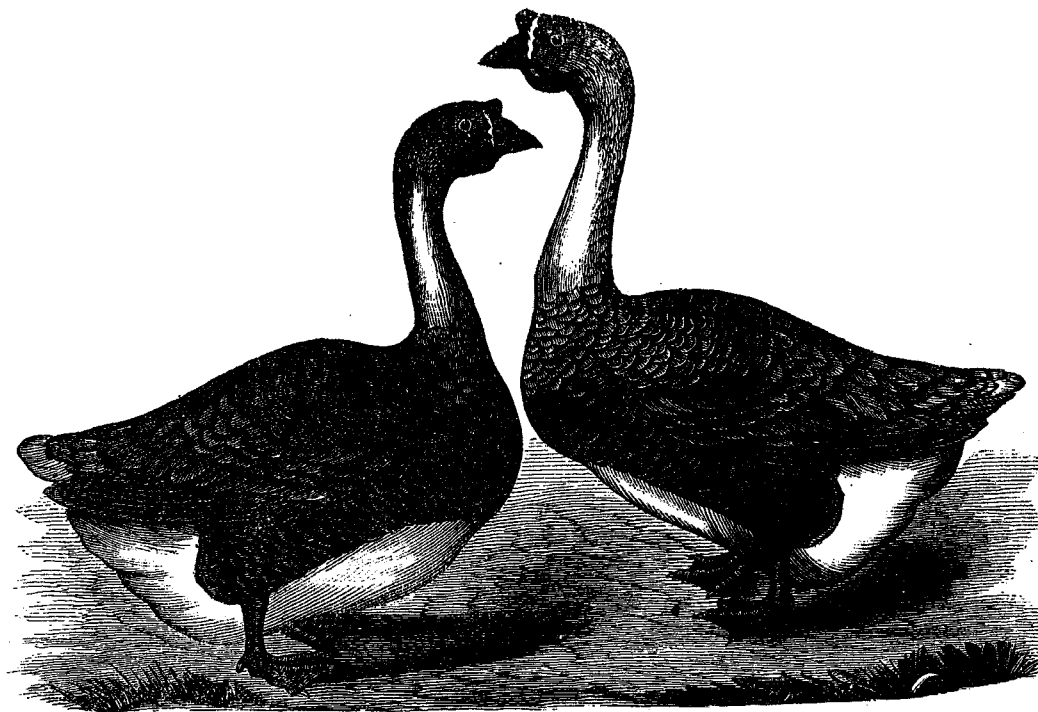
THE HOOKED-BILL DUCK.

This is an old breed, described as early as 1676, and frequently delineated by the old Dutch masters. Its characteristic is a turning down of the bill.

THE PENGUIN DUCK.

This breed is characterized by greater length of the upper bones of the leg, which causes it to assume a half-erect attitude, somewhat resembling that of the Penguin.

These breeds are but variations of the ordinary duck, which have been perpetuated by the care of man.



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HONG KONG GOOSE.

THE FARM-YARD DUCK.

This, among ducks, is what the ordinary dunghill, or barn-door fowl, is among chickens, and is far inferior to the Rouen, Aylesbury, Cayuga or Pekin breeds.

THE LABRADOR, BLACK EAST INDIAN OR BUENOS AYRES DUCK.

This duck is another instance of misapplication of geographical names, since it is neither common in Labrador nor in the East Indies. The British Zoological Society received its first specimens from Buenos Ayres, but this fact alone is not sufficient evidence that they originated in that locality.

This breed, by the curled feather in the tail of the drake, shows its relationship to the Mallard, and is regarded merely as a variation of that species, although its color is quite different, being of a deep, lustrous black throughout, in both sexes.

These ducks do not become so thoroughly domesticated but that they will take long flights from the barn-yard in search of food or water, sometimes absenting themselves for days together, but generally returning at the approach of night-fall.

In size the Buenos Ayres duck is very small, and among fanciers it and the Call-ducks correspond to the Bantams among chickens, and are bred especially for smallness of size.

CALL-DUCKS.

This name is given to two varieties of small domestic ducks, the white and the gray; both differing from the ordinary breeds in their small size. In color the Gray Call should be an exact counterpart of the wild Mallard, and the White Call should be pure white. Its bill, however, is not flesh-colored like that of the Aylesbury, but is a clear, unspotted yellow, any other color disqualifying the birds from competition in the show-pen.

Call-ducks, as their name implies, are remarkable for their loud and continuous quacking, in a shrill, high note, which renders them valuable to the sportsman as decoy ducks.

MANAGEMENT OF DUCKS.

With regard to the management of the duck-yard we cannot do better than to quote the following directions, written by Fanny Field for the *Prairie Farmer*:

"Every farmer who has a pond or stream of water on his premises should keep a few pairs of ducks, at least. As a rule, where there is any market within a reasonable distance of the farm, ducks and ducklings may be profitably reared. Young ducks, in good condition, always command a good price in city markets, their feathers sell at a good price, and the eggs for cooking, and a roast duck occasionally, make tempting additions to the farmer's table. A good many farmers, who live too far from market to render it profitable to raise ducks for sale, would find that it would pay to raise them for feathers, and for meat for their own tables. Where one is blessed with a family of children the entire

charge of a flock of ducks might be given over to the little folks, and they would take an infinite amount of pleasure in caring for the ducklings, collecting the eggs, feeding the old ducks, and watching their antics in the water. And then your little folks would be learning something all the time, and, take my word for it, there is nothing so good for children as to give them something to care for—to have them feel a sense of responsibility.

"About the 'best breed,' the Pekin, Rouen and Aylesbury are the three leading varieties of ducks, and experienced breeders rank them in the order named. Some attempts have been made by breeders of the Rouens and Aylesburys to run down the Pekins, claiming that the Rouens would at maturity outweigh the Pekins, and that the Aylesburys were superior as table birds. I can say nothing against the Rouens and Aylesburys. Both are fine, large ducks, prolific layers, and breed well; but I *know* that the Pekins, when pure bred, are the best breed of ducks that we have in the United States. For early maturity, laying quality, size, and as table fowls, they have no superior in this country. When any one says that the average Rouens will, at maturity, outweigh the Pekins, he says what every breeder, who has fairly tried both breeds, knows to be incorrect. W. H. Todd, of Vermillion, Ohio, once exhibited a pair of Rouens that weighed nineteen and three quarter pounds, and at that time they were the largest pair of Rouens in the country, if not in the world, but I have sold dozens of pairs of Pekins that weighed twenty and twenty-two pounds a pair. I once had a pair that weighed twenty pounds at eight months of age.

"All ducks are naturally inclined to lay around any where, but by proper management this habit may be overcome and all the eggs saved. A pen or yard should be made somewhere near the pond or stream, if not too far from the house, and the ducks driven or coaxed into the pen at night. As ducks always lay at night, or very early in the morning, the eggs can be collected early in the morning, the ducks fed and turned out for the day. By feeding only at night and morning, regularly, and always at the pen or yard, the ducks will soon come regularly at sundown for their food, and can then be shut up for the night. But don't ever give your ducks a hearty supper and then shut them up all night without water; if you do you may find some dead ducks the next morning.

"Have a trough of water in the pen, or at the feeding place. For a small flock a rail pen may be constructed and covered with boards. Have one side higher than the other, so that the board roof will shed rain. I have a good-sized yard near the water, surrounded by a picket fence, and with a long, low shed across the north side. Nests are placed along the back side of the shed, and the floor is well-covered with dry gravel and earth, which keeps it free from filth. This spring I intend to extend the fence, so as to inclose a portion of the stream, and put in water-gates, so that there will be plenty of water in the yard at all times. Of course the ducks are only confined in the yard at night, but I find that in winter and during the cold rains of early spring and late fall, they spend a good deal of the time under the shed.

"As ducks frequently lay for two or three months before they take a notion to rear a family, it is necessary, especially when one wishes to raise a large number of them, to set some of the first-laid eggs under hens. The same directions

given for preparing nests and setting hens on their own eggs must be attended to when setting them on ducks' eggs. Do not crowd the nest; five ducks' eggs are enough for a small hen, and seven or eight for a Brahma or Cochin. Unless the eggs are set on the ground, particular attention must be paid to the sprinkling with tepid water during the last two weeks of incubation. Sprinkle slightly every day while the hen is off for food. Neglect this, and your chances for ducklings will be greatly lessened.

"Ducks' eggs usually hatch well. With fresh eggs that have not been chilled, and have been carefully handled, you may count on ducklings at the rate of ninety for every one hundred eggs set. I don't think it pays to hatch ducklings very early in the season, unless one wishes to raise some extra large birds for exhibition. Ducklings grow rapidly, and if hatched in April and May will grow to a good size for the winter market.

"The proper time for picking ducks may be ascertained by catching two or three out of your flock and pulling out a few feathers here and there; if they pull hard and the quills are filled with bloody fluid the feathers are not 'ripe,' and must be left a while longer; but if they come out easily, and the quills are clear, the feathers are called ripe, and the birds should be picked at once, or they will lose the greater part of them. To pick a duck before the feathers are fully ripe is to injure the bird very much. You will find a bunch of long, rather coarse feathers under each wing; do not pluck them, they support the wings. When picking take but few feathers at a time between the thumb and forefinger, and give a short, quick jerk downward.

"With comparatively little practice you will get the 'knack' of picking easily and rapidly. Before commencing, tie the duck's legs together—not with a cord that may cut into the flesh and lame the bird, but with a tolerably wide strip of cloth—and if the ducks are inclined to pinch with their bills, draw an old cotton stocking over their heads; but with the exceptions of now and then a vicious old drake, our Pekins are as tame and peaceable as kittens, so we never bother the ducks nor ourselves with 'night caps.' Handle laying ducks carefully, and sitting ducks and those you intend to set soon should not be picked. When handling young ducks do not lift or carry them by the legs with the head hanging downward; their bodies are heavy, their bones tender and easily broken, and their joints may be dislocated. In hot weather a great deal of the down may be taken from the drakes, but the down should never be taken in cold weather. Ducks can usually be picked from four to six times a year."

For the Pekin and Cayuga ducks water to swim in is by no means a necessity; indeed some breeders claim that they do better without it. The young ducklings enjoy it very much, however, and they may easily be satisfied by sinking a shallow box in the ground near the barn-yard pump.

The food of the ducklings may be very much the same as for young chickens. They are more easily raised than chickens, being hardier, and free from that scourge of chickenhood—the gapes. When very young, however, they should not be exposed to heavy rain-storms.

Ducks are voracious eaters, and to handle them profitably the surplus should be marketed as soon as fit, keeping through the fall and winter only those necessary for breeding stock.

CHAPTER XX.

GEESE AND SWANS.

Geese belong to the family *Anatidæ* of modern ornithologists, and sub-family *Anserinæ*. The common domestic goose is supposed to have descended from the wild Gray-Lag goose of northern Europe, *Anser ferus* or *A cinereus* of the naturalists. This species has at one time extended from the British islands to China, and was formerly quite numerous in England, breeding in the fen-marshes of that country. Of late years, however, it does not breed to any extent south of Scotland.

The Gray-Lag is regarded as the parent of four of our ordinary varieties of geese; namely, the common gray and white goose, the white Embden, or Bremen goose, the gray Toulouse goose, and the peculiar white Sebastopol goose.

The ordinary wild goose of America is the Canada goose, *Anser Canadensis*, which has been domesticated here to a very limited extent, but has not become the parent of any thoroughly domesticated breed, like the turkey, or the common goose.

A third species which has representatives in domestication is *A. Cygnoides*, or *Cygnopsis Cygnoides* or the swan-like goose, represented by the knobbed Chinese geese.

A fourth species is the Egyptian goose (*Chenalopex*), which has sometimes been bred in this country, but presents few marks of value.

Besides these are numerous wild species, including the Bean-geese and the Pink-footed goose of Britain, the Snow-geese of North America, and many others.

THE COMMON GOOSE.

This is one of the most anciently domesticated of fowls, as shown by the fact that it was mentioned, as being in domestication, by Homer, and that geese were kept in the Capitol at Rome, 388 B. C., as sacred to Juno; this sacredness implying great antiquity.*

Naturalists are not fully agreed as to the present form of the common goose, but the preponderance of opinion is in favor of ascribing its origin to the wild Gray-lag goose of northern Europe; its difference in color from that species being a much smaller variation than has occurred in the cases of most other anciently domesticated animals.

In the wild Gray-lag, the male and female are of the same dusky hue, while in the tame species the gander is generally pure white, and the goose dusky on the

*Darwin, Variation Animals and Plants, etc., Vol. I, p. 302.
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wings, in this respect resembling the markings of the two sexes of the Rock goose (*Bernicla antarctica*) of Terra del Fuego and the Falkland islands.*

The tendency toward a white plumage would also be encouraged by the custom of plucking the feathers, as it has been noticed in birds of colored plumage that the loss of a feather at other times than the moulting period, is liable to be followed by the growth of a white feather in its place.

THE TOULOUSE GOOSE.

This is a large, gray goose, its color being brownish-gray on the back, and lighter on the belly. The skin of the breast and belly shows a tendency to hang in folds, as shown in the illustration on page 191, a tendency which detracts from the value of the breed for market purposes, as it gives the impression of greater age than the goose may actually possess.

The Toulouse goose has come to us by way of England, where it has been bred for many years. Its name would indicate a French origin, were not the geographical names of fowls so misleading. It is easily fattened, sometimes reaching a weight of sixty pounds to the pair, and its cross with the common goose is thought to be even larger than the pure breed.

THE EMBDEN, OR BREMEN GOOSE.

This large, white goose is probably of Dutch origin, as its name indicates; Mr. Hewitt (English) states that his best specimens were imported from Holland, while the first ever brought to America were imported from Bremen by John Giles, of Providence, R. I., and Colonel Samuel Jaques, of Medford, Mass., some sixty years ago.

Mr. Hewitt gives this breed a decided preference over the Toulouse, on account of their white feathers (both sexes being pure white), which are worth more in market than colored ones, and on account of the absence in the young birds of the pendant abdominal pouch of the Toulouse, and their earlier laying.

In weight the two breeds run very closely together, and either is undoubtedly a great improvement over the common goose.

THE SEBASTOPOL GOOSE.

This goose is remarkable for its peculiar curled plumage, which is better represented in the cut (see page 203) than it can be by a verbal description. In size the Sebastopol goose is small, its chief merit being its oddity. In color it is pure white.

It was first exhibited in England in 1860, by Mr. T. H. D. Bayly, who imported it from Sebastopol. In this country it is sometimes called the Danubian goose, and is said to be common along the Danube.

THE CANADA OR AMERICAN WILD GOOSE.

This goose, as previously stated, belongs to a different species from the foregoing, a fact further emphasized by its failure to produce a fertile cross with the common goose.

*Darwin, Variation of Animals and Plants, etc., Vol. I., p. 308.

The Canada goose is occasionally exhibited at poultry-shows, but it does not breed readily in confinement, even when captured very young. In size it is much smaller than the common goose, which, with the fact that it would take many generations to breed out its wild disposition, gives little encouragement to the attempt to domesticate it.

CHINESE GEESSE.

Of the Chinese geese, representing the species *Cygnoides*, we have three varieties, of which the largest and most popular is

THE HONG KONG GOOSE,

sometimes called the African goose. These geese have been known in America for about thirty years, but have not yet become very common, owing partly, no doubt, to the fact that they lay but few eggs as compared with the Bremen and Toulouse.

Some of the earliest importations of these geese are recorded to have weighed fifty-six pounds per pair (goose and gander), and forty to fifty pounds to the pair is not an uncommon weight.

These geese are especially valuable for crossing upon the common goose, such crosses being of large size, quiet and productive, and no doubt we shall soon have improved American varieties which will combine the good qualities of the foreign and the common breeds, just as we have among chickens.

The Hong Kong goose is brown in color, in this respect resembling the Toulouse, but it is distinguished by the horny knob at the base of the upper mandible, which gives it the specific name of *cygnoides*. Our illustration on page 197 gives a better idea of its appearance than any verbal description can.

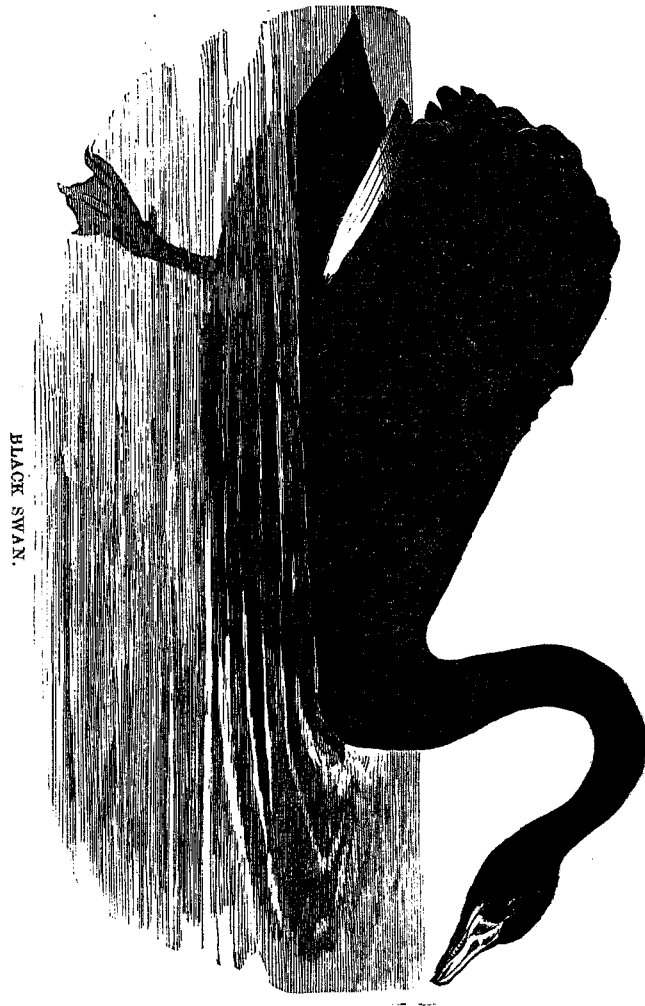
BROWN AND WHITE CHINA GEESSE.

These geese have the knobbed bill of the Hong Kong goose, but they are smaller in size, being smaller even than the common goose. In shape, however, they are very elegant, having an upright, swan-like carriage, and on this account are much esteemed. The Brown variety is of dark plumage, resembling that of the Hong Kong, and with a dark stripe running down the back of the neck; the White variety is of pure white plumage, but in size and shape the counterpart of the Brown.

THE EGYPTIAN GOOSE.

This variety is recognized by the *American Standard*, although it is bred to but a limited extent. It belongs to the genus *Chenalopez*, and some naturalists are inclined to class it with the duck, rather than with the goose family, on account of the males having the peculiar enlargement at the junction of the bronchial tubes with the trachea, which is characteristic of the ducks.

This classification is supported by the fact recorded by Darwin, of the interbreeding of these geese and the Penguin variety of the common duck in the English Zoological Gardens.



BLACK SWAN.

In size and form these geese are somewhat small and slender; their plumage is generally gray, shading into chestnut and yellow on the breast and under parts, and into white on the shoulders. The feathers are beautifully pencilled with black lines, which unite to form a stripe, or bar, across the wings, of a rich metallic lustre.

These geese have the reputation of being unproductive.

THE CEREOPSIS GOOSE.

This curious goose, the *Cereopsis Novæ-Hollandiæ*, is so called from the *cere* or wax-like coating which covers a large portion of the beak. It is a native of Australia, where it has, however, become almost extinct. It is some times also called the Cape Barron goose, from being found among the Cape Barron islands, in Bass's straits. It is of large size; of a brownish-gray color; bears confinement well, breeding without difficulty, feeding on grass, like the common goose, and fattening readily; but it is very quarrelsome in disposition, which detracts from its value as a domestic fowl.

This goose has been bred at the Zoological Gardens in England, but has not generally been brought into domestication. The good qualities which it possesses would seem to justify the attempt to breed out its faulty disposition, by crossing with more peaceable breeds.

THE MANAGEMENT OF GEESE.

If the goose is well fed and housed she will commence laying early in the spring, and will lay in the neighborhood of a dozen eggs, when she will want to sit. Her time of incubation is about twenty-nine days. The goslings are hardy, and require about the same attention as ducklings, except that grass and water are more necessary to them. Grass is the principal food of geese during the summer, and in pursuit of this food they are apt, when kept in large flocks, to injure the pastures for other stock, both by fouling them with their droppings and by close grazing. They do not bite off the grass like cattle and sheep, but pull it off, frequently bringing along a portion of the root.

As they lay so few eggs, geese are kept only for their flesh and feathers: The latter are plucked two or three times during the summer, and the annual yield is from a pound to a pound and a quarter, worth from forty to sixty cents a pound, while a good, fat, young goose should weigh ten to fourteen pounds, dressed, in the fall, and be worth from one to two dollars.

Geese live to a considerable age—ten to twenty, or even forty years—and the females are better layers and better mothers after they are two or three years old. The ganders, however, become pugnacious and unproductive, hence they should not be kept beyond two or three years. For breeding purposes there should be one gander for every three or four geese.

The disposition of geese to wander about is one of the drawbacks to keeping them, and no one should undertake it whose fences are not good enough to prevent them from trespassing upon neighbors. By clipping their wings they are very easily restrained.

SWANS.

These, the most elegant of all water-fowls, are becoming, as they deserve, more and more common in our public parks, and we hope that the time is not far distant when their cultivation shall be considerably extended. About ten species of swans are known to naturalists, of which but three have been domesticated, namely, the White swan, which is of the two European species, *Cygnus olor* (Red-billed swan), and *C. immutabilis* (Polish swan), and the Black swan of Australia, *Chenopsis atrata*.

The following notes on the habits of the *White swan* were communicated to the *Poultry World* by W. D. Davis, of Warner, N. H.:

"When we consider how many bodies of water there are which might be graced by them it is to be regretted that so little is known of these, the most elegant and graceful fowls in the world. There are in this country two kinds, the Black and the White; the latter being handsomer, more common and more docile. Not so large a body of water is necessary for them as one would naturally suppose. We remember a pair in Maryland that occupied, in common with ducks and geese, a pool of water twenty-five feet across, and not over three feet deep. The swans remained nine tenths of the time in the water, hardly ever coming on shore. Their food was wheat-bread, grass, and green corn-fodder; the latter they were very fond of. To settle the question whether they would eat grain when they could get green food, we moved them to another small pond, and on the edge of it poured down, in a heap, equal quantities of corn and oats, continuing to feed them as before. The grain was not touched until it sprouted, when they picked off the green blades only.

"When left to themselves, they slept in the middle of the pond at night. One morning in December, the night having been unexpectedly cold, we found them completely surrounded by ice two inches thick. We then removed them to a room in the poultry-house, giving them water, bread, cabbage leaves, etc., which was their food for the winter.

"Early in the spring they lay eggs considerably larger than goose eggs; frequently only two, and rarely over eight in number. After sitting thirty-five days the young swans, or cygnets, are hatched. They, being very hardy, are easily raised, and are considered a great delicacy by the epicure. The old ones care for the young with great vigilance, and, if the pond be of the proper size, require little or no food. As they live most peaceably in pairs, it is advisable to have only that number, though more can be kept, as, for instance, at the Central Park, New York. Being long-lived (having been known to live one hundred years in England), less troublesome than other fowls, and also very quiet, they should have a decided preference over their more brilliant and noisy rival, the peafowl. We hope the day is not far distant when not only public parks will be graced by these lovely birds, but also the private grounds of every lover of the beautiful."

The *Black swan* is smaller than the White variety, and is more shy in disposition, owing chiefly, no doubt, to having been in domestication a comparatively short time. At present it is found, in this country, chiefly in the parks of our larger cities. This bird is well shown in the illustration on page 207.

CHAPTER XXI.

PIGEONS.

A thorough discussion of the various breeds of pigeons would fill a volume, as the described varieties of the domesticated pigeon number nearly three hundred; moreover, pigeons are rather to be considered as pets than as profitable poultry, hence we shall only attempt here to give a short description of a few of the more characteristic breeds, with general hints as to their management.

The wild species of pigeons are also very numerous, several being peculiar to North America, and numerous others being known in other continents. Those which are of most interest here are the common Turtle Dove, or Carolina pigeon (*Columba Carolinensis*), and the Migratory, or Passenger pigeon (*C. migratoria*). These are too well known over the whole United States east of the Rocky mountains, to need description here. The species, however, which is believed to be the parent form of the domestic dove, or pigeon, is the Rock pigeon (*C. livia*), of Europe and Asia. This pigeon does not nest in trees, but on the ground or among rocks; it is easily domesticated, social in its habits, and breeds readily with the domestic varieties. These facts, taken in connection with the fact that the domestic pigeon manifests great awkwardness in perching in trees, and seems nearly or quite incapable of nesting there, certainly indicate a close relationship between it and some one or more of the wild Rock pigeons, of which there are several varieties.

For convenience in classification, Mr. Darwin has arranged the different varieties of the domestic pigeon into four groups; these he has divided into eleven races; and these into sub-races, each containing one or more varieties.

The first group includes but a single race, that of the *Pouters*. These are distinguished by the abnormal size of the œsophagus, which is barely separated from the crop, and is capable of being inflated to an astonishing size. The beak is of moderate dimensions. This race is divided into four sub-races as follows:

1. The improved *English Pouter*.—In good specimens of this breed the beak will be nearly buried when the œsophagus is fully expanded. The males “pout” more than the females, and take great pride in their power. The bird appears to stand almost upright.

2. The *Dutch Pouter*.—This is thought to be the parent form of the preceding. The birds are smaller than English Pouters.

3. The *Little Pouter*.—A variety of the Dutch Pouter, in which the œsophagus assumes a spherical form, as if the bird had swallowed a large orange.

4. The common *German Pouters*.—In this breed the œsophagus is much less distended, and the bird stands less upright.

The second group comprises the three races of Carriers, Runts and Barbs. These, especially the Carriers and Runts, grade into each other by almost imperceptible degrees, while the Carriers also pass, through foreign breeds, into the Rock pigeon. This group is characterized by the beak being long, with the skin over the nostrils often carunculated or wattled, and with that around the eyes bare and also carunculated.

The *Carriers* (Race II.) have elongated, narrow, pointed beaks; eyes surrounded by much naked, generally carunculated, skin; neck and body elongated. They include four sub-races, namely:

1. The *English Carrier*.—This bird is of large size, with a greatly elongated beak, neck and tongue. The carunculation around the eyes, over the nostrils, and under the lower mandible is excessive. Birds of this race are too valuable to be flown as carriers.

2. *Dragons, Persians, or Bagdad Carriers*.—The English Dragon is smaller and less carunculated than the English Carrier.

3. *Bagadotten Tauben*, of Neumeister.—A German breed, closely allied to the Runts. Peculiar from having a long, curved beak. Body large; feathers of wings and tail comparatively short.

Bussorah Carrier.—A Persian breed, which differs from the Bagdad Carrier in bearing a greater resemblance to the Rock pigeon.

The names applied in different parts of Europe and in India to the several kinds of carriers all point to Persia or the surrounding countries as being the source of this race.

The *Runts* (Race III.) have long, massive beaks, and bodies of great size. The various sub-races shade into each other by such small differences that an exact classification is impossible. The following five sub-races have been based upon the most prominent differences:

1. *Scanderoon* of English writers.—Birds of this sub-race differ from the Bagadotten only in having the beak less curved downward, and in the naked skin around the eyes and over the nostrils being but little carunculated.

2. *Pigeon cygne* and *Pigeon bagadais* (Scanderoon of French writers).—These differ from the preceding in greater length of wing, shorter beak, and greater carunculation.

3. *Spanish* and *Roman Runts*.—Heavy, massive birds, with shorter necks, legs and beaks than the foregoing races; but slightly carunculated; scarcely to be distinguished as separate sub-races.

4. *Tronfo* of Aldrovandus.—A variety described by Aldrovandus, but probably now extinct.

Murassa (Adorned Pigeon), of Madras.—A handsome, checquered bird from Madras, intermediate between the Rock pigeon and a very poor variety of Runt or Carrier.

Barbs (Race IV.)—These have short, broad, deep beaks; naked skin around the eyes, broad and carunculated; skin over the nostrils slightly swollen. This race is shown to be closely related to the Carriers, especially in the newly-hatched of both races, which resemble each other much more closely than do young pigeons of other and equally distinct breeds. The Barbs are really short-beaked Carriers.

The third group is artificial, including a heterogenous collection of distinct forms. It may be defined by the beak, in well-characterized specimens of the different races, being shorter than in the Rock pigeon, and by the skin around the eyes not being much developed. It includes the races of Fantails, Turbits and Owls, Tumblers, Indian Frill-backs and Jacobins.

The *Fantails* (Race V.) are represented by the sub-race of *European Fantails*, in which the tail is expanded after the manner of that of the strutting male turkey or peacock; the oil-gland is aborted; the body and beak rather short. The number of the tail-feathers is used as a characteristic for the different varieties; it varies from twelve up to thirty-two or thirty-four, the normal number of the genus *Columba* being twelve. The neck is thin and broad backward; the breast broad and protuberant; the feet small. The carriage of the Fantails is very different from that of other pigeons. In good birds the head touches the tail feathers, and the birds walk in a stiff manner, while the neck has a convulsive, trembling motion.

A second sub-race of Fantails is also found in Java. The tail is less developed than the preceding, and the oil-gland is not aborted. Fantails were known in India previous to 1600, and it seems probable that the Java Fantail represents the breed in its earlier and less improved condition.

The *Turbits* and *Owls* (Race VI.) have divergent feathers along the front of the neck and breast; the beak is very short, and rather thick vertically; the oesophagus somewhat enlarged. The Turbits and Owls differ from each other slightly in the shape of the head; the former have a crest, and the beak is differently curved. The feathers in the front of the neck diverge irregularly, like a frill, and the birds have the habit of continually and momentarily inflating the upper part of the oesophagus, which causes a movement in this frill. The Pouter inflates both the true crop and the oesophagus; the Turbit inflates, in a much less degree, the oesophagus alone.

The *Tumblers* (Race VII.) have the habit of tumbling backwards during flight. The body is generally small; the beak short, sometimes excessively short and conical. This race includes four sub-races, namely: The Persian, Lotan, Common, and Short-faced Tumblers, and these sub-races include many varieties which breed true.

1. *Persian Tumblers*.—The birds of this sub-race are rather smaller than the wild Rock pigeon, white and mottled, and slightly feathered on the feet.

2. *Lotan, or Indian Ground Tumblers*.—White, slightly feathered on the feet, with the feathers on the head reversed. When gently shaken and then placed on the ground immediately, they begin tumbling heels over head, and only stop when taken up and soothed by blowing in their faces. This habit was recorded before the year 1600.

3. *Common English Tumblers*. These birds are rather smaller than the Persian, and have the same habits, but tumble better, sometimes spinning round and round in the air like a wheel. Some varieties begin tumbling almost as soon as they can fly; at three months old they tumble well, but still fly strong; but by the second year they tumble so excessively that they mostly give up flying. The tumbling seems to be an involuntary movement, over which the birds have no control, although they seem to try to prevent it. Sometimes, when trying to

fly forward, this tumbling impulse causes them to rise straight upward for a yard or two.

4. *Short-faced Tumblers*.—These have short, sharp and conical beaks, with the skin over the nostrils but little carunculated. Their heads are nearly globular and upright in front. They are the smallest of pigeons, weighing sometimes as little as six to seven ounces when two years old. The Short-faced Tumblers have almost lost the power of tumbling. There are several sub-varieties.

Indian Frill-backs (Race VIII.)—These are characterized by very short beaks, and reversed feathers, resembling those of the frizzly fowls.

Jacobins (Race IX.)—In this race the feathers of the neck form a hood; the wings and tail are long; the beak moderately short. The hood is their most distinctive feature, and seems to be merely an exaggeration of the crest of reversed feathers on the back of the head. The wings and tail are elongated, so that they are longer than those of the larger Rock pigeon.

The fourth group is characterized by the resemblance of its members to the Rock pigeon.

The *Trumpeter* (Race X.) is the only well-marked race of this group. Its characteristics are a tuft of feathers at the base of the back, curling forward; feet much feathered; voice very peculiar; size exceeding that of the Rock pigeon. The voice of the Trumpeters is wholly unlike that of any other pigeon; the coo is rapidly repeated, and is continued for several minutes, hence their name. Their feet are so heavily feathered that they almost appear like wings.

Race X. is made to include a number of sub-races which differ but little in structure from the wild Rock pigeon. Among these are,

1. *Laughers*.—Small of size, and distinguished by the peculiar voice, which seems to repeat the word "yahoo, yahoo!"

2. *Common Frill-backs*.—Beak rather longer than in the Rock pigeon, feathers reversed. A considerably larger bird than the Rock pigeon. The points of the feathers, especially on the wing-coverts, are turned upwards, or backwards.

3. *Nuns*.—These elegant birds are smaller than the Rock pigeon; in young birds the scutellæ on the tarsi and toes are generally of a leaden-black color; and this is a remarkable character (though observed in a lesser degree in some other breeds), as the color of the legs in the adult state is subject to very little variation in any breed. Nuns are symmetrically colored, with the head, primary wing-feathers, tail and tail-coverts of the same color, namely, black or red, and the rest of the body white. This breed has retained the same character since Aldrovandus wrote, in 1600.

4. *Spots*.—These are but little larger than the Rock pigeon, and with the feet decidedly smaller. They are symmetrically colored, with a spot on the forehead, with the tail and tail-coverts of the same color, the rest of the body being white. The breed was known in 1676.

5. *Swallows*.—These birds have a larger spread of wing and tail than the Rock pigeon, but smaller bodies. Their heads and wings are of the same color as the Rock pigeon, the rest of the body being white.*

*Variation of Animals and Plants, etc., Vol. I., page 137-165.

Besides these there are several other breeds of minor importance, in addition to the varieties of the common Dove-cote pigeon.

Of the above named races the Fantails, Jacobins, Pouters, Tumblers, and Carriers or Homing pigeons are best known to American Fanciers.

MANAGEMENT OF PIGEONS.

The management of pigeons must be varied to suit the habits of the variety kept; thus the common Dove-cote pigeon requires little or no care, further than to provide lofts or nesting-boxes in which they may nest and roost. All domestic pigeons prefer to roost on flat surfaces, as their feet are not adapted to clinging to poles; they should also have narrow ledges in front of the openings to the loft and nesting-boxes, upon which to alight in entering.

The nesting-boxes should be about three feet long and eighteen inches high and wide, for each pair of birds, in order to give them room to make two nests, as they are liable to quarrel and break their eggs if confined to a single nest. Pine sawdust is one of the best nesting materials, being less congenial to lice. If space is very limited these nest-boxes may be nailed to the side of a building, but it is very much better to give the birds a small loft, in which to exercise in bad weather, and to place the nest-boxes in this, either along its sides or on the floor. Wherever the boxes are placed they should be so arranged that one side may be opened in order to clean out and whitewash the inside occasionally.

The old birds feed the young, of which but one or two are produced at a time, after an incubation of eighteen days. If many birds are kept, food, in the shape of grain, peas, etc., should be placed within reach, but they will gather a large part of their living from the fields and roadsides. The young birds remain in the nest until of nearly full size, becoming excessively fat; in this condition they are called *squabs*, and are considered great delicacies. Two broods are often produced during a season, and sometimes three, so that a single pair of birds may increase to six or eight during a summer.

In the management of the fancy breeds, more care is necessary, as they are more delicate, and less capable of flight. For these a larger loft should be provided, and this should have a window with a wire cage attached, so that the birds, when confined, may still have access to air and sunlight.

The Pouters are not always good parents, and it is sometimes necessary to give part of their eggs to birds of other varieties, allowing each pair to raise one young one in order to dispose of their surplus food, this being found necessary to the health of the birds.

The Carrier pigeons are trained by taking them, in a covered basket, two or three miles from home, and then liberating them. Such as fail to reach home may be considered as worthless. The distances to which they are carried are successively increased, until they become able to return with certainty and safety when liberated hundreds of miles from home.

These birds have been employed for the carrying of messages for ages; the most celebrated instance of their use in modern times being at the siege of Paris, where, after being carried out of the city in balloons, they returned, bearing long messages, condensed into microscopical space by the process of micro-photography. On long flights they are expected to average about thirty miles an hour.

CHAPTER XXII.

THE DOMESTICATION OF WILD BIRDS.

The various breeds of fowls which have been described in the foregoing pages are undoubtedly all descended from a few wild forms. In some cases we are almost able to trace the history of a breed back to its original domestication; but more often we are led into the dim mists of pre-historic times, from which we see man emerging, already surrounded by his flocks and herds. Of such non-migratory races as the Chinese and Egyptians neither history nor tradition can point to the time when they had no domestic animals. With the nomadic races which settled the western countries, however, their earliest animals were, of course, such as could accompany them in their frequent pilgrimages and assist them in their quest for food, of which the most valuable and the earliest tamed would naturally be the dog. Indeed, the remains of the dog are found associated with the earliest known human remains. Fowls could only have been added to their possessions after they had relinquished their nomadic habits, and become a pastoral, if not an agricultural people. Hence we should expect to find the original home of the domestic fowl among those people who have longest been tillers of the soil, or in Egypt, China, and India, and in these countries we find that the common fowl, the goose, duck, and peafowl, have been domesticated from time immemorial. As civilization progressed westward this list was swelled by the addition of the turkey and the guinea-fowl. The question now arises, are these all the varieties of birds that may be profitably added to our poultry-yards? In the discussion of this question it is necessary to consider a few of the points involved in the domestication of a wild animal.

In the first place, the animal so domesticated must possess some quality of use or beauty which will give it an actual value to man, and, to render this value permanent, it must possess the ability and disposition to perpetuate its kind under the changed conditions to which it is subjected in domestication. This has been found the fatal objection to the taming of many kinds of birds and quadrupeds—that they would not breed in confinement. In reference to this point Mr. Darwin adduces numerous examples, chiefly drawn from the experience in the management of wild animals and birds at the London Zoological Gardens, the old Surrey Gardens, and the Jardin des Plantes at Paris. In the aviaries of these institutions birds of prey have very seldom been known to couple, and have still more infrequently produced fertile eggs; of the smaller graminivorous birds the canary-bird is almost the only one, out of many species which have been kept in confinement, that has bred with any regularity; several species have produced fertile hybrids with the canary, but yet refuse to reproduce their own kind. The parrot, one among the longest lived of birds, and one which has long been tamed, yet “breeds so rarely that the event has been thought worth

recording in the gravest publications." Even in their native countries, where they are reared in large numbers, and are kept so tame that they fly freely about the houses, coming, like pigeons, to be fed, they never breed.

On the other hand, the great pigeon family generally breeds almost as freely under confinement as when free, and many kinds of gallinaceous birds breed quite freely in captivity. There are some exceptions here; the common partridge, for instance, has rarely bred, even when kept in large aviaries; the grouse has frequently bred when confined, and the pheasant also, though not so freely as when free.

The ostrich offers a striking example of the difficulty of deciding beforehand whether an animal will submit to domestication, as it retains its fertility, although somewhat impaired, when removed from its native haunts on desert plains and in tropical forests to confined enclosures in a temperate climate.

Most waders can be tamed, often with remarkable facility, and the cranes frequently breed freely, yet several birds belonging to this order refuse to breed, even in their native countries.

The ducks and geese generally breed as freely as the pigeons and the Gallinæ, but there are some exceptions; thus Audubon kept some common wild or Canada geese for more than eight years, yet they would not mate, while others have had them to produce young during the second year. Of the gulls no instance is recorded of any variety except the herring-gull (*Larus argentatus*) ever breeding in captivity.*

From these examples it will be seen that a serious difficulty is likely to meet us at the outset in the attempt to bring any new species of fowl under domestication. Sometimes this difficulty will be found insurmountable, but in most cases even the most obstinately sterile species have at some time or other produced offspring in confinement, and, when one is so fortunate as to witness such a departure from the general habit, the offspring so produced should be carefully preserved and bred with its species, with the hope of finding the habit broken in that case.

In previous pages we have incidentally mentioned several partly domesticated birds as being worthy of further culture, such as the Honduras Turkey and the Cereopsis Goose. To these may be added the Eider Duck, which is partly domesticated in Ireland and Norway, where it frequents low rocky islets near the coast, and has long been afforded encouragement and protection, a heavy fine being imposed for killing it during the breeding season, while artificial nesting-places are in many localities contrived for its further accommodation. These nesting-places are regarded strictly as private property, and are protected as such by law. The ducks nest in these places, laying about five eggs, and bedding them in down which they pluck from their breasts. These eggs and the down are then taken by the owner of the "Eider-fold," when the duck will lay again. Towards the end of the season the duck will be allowed to hatch a few eggs to keep up the stock.

Eiders of different species inhabit all northern coasts. Those of the eastern United States have been much diminished by persecution, but are still abundant

*Variation of Animals and Plants, etc., Vol. II., pp. 136-140.

from Newfoundland northward. Three species also inhabit the west coast of the United States.

Among gallinaceous birds which give the most promise of being profitably domesticated are: 1. The *Guans* (*Peliponinae*) of Mexico and the South American continent. These generally have bare throats, and frequently have wattles. In habit they are chiefly arboreal, and they readily become tame, but have not often, if ever, been induced to breed in domestication. They are said, however, to hybridize readily with the common fowl, and in Texas these hybrids are asserted to be far superior to the ordinary game fowl for fighting purposes. Some of the species reach the size of a small turkey, weighing seven or eight pounds when full grown; they live principally on leaves, grass, fruits, etc.

2. The *Curassows*, or Mexican Pheasants. These birds are worthy of cultivation for their plumage alone, and for that purpose are kept in our larger aviaries. In size they are almost equal to the turkey; they have short wings, long and broad tail, and strong bill. With the exception of a single species found north of Panama they are confined to the tropical forests of South America, east of the Andes, and not extending south of Paraguay. They live in small flocks, and are arboreal in their habits, only occasionally descending to the ground, while always roosting and nesting in the branches of trees. They feed on fruits, seeds and insects. They are said to be domesticated in several parts of South America, and it is said that they were taken to Holland from Dutch Guiana towards the end of last century and completely acclimatized and domesticated there, breeding in confinement like ordinary poultry, but the establishments in which they were kept were broken up during the troubles that followed the French Revolution. Their flesh is said to be exceedingly white and delicate. The Mexican Curassow, found from Panama northwards, is about three feet in length, of a glossy black color, with green and purple reflections over the whole body, excepting the abdomen and tail-coverts, which are white. In common with the other species of this genus its head bears a crest of feathers curled forward at the tips, which can be raised or depressed at will. The female is of a reddish color, although varying greatly in this respect, and was until lately described as a separate species—the Red Curassow.

It would certainly seem worth while to make further attempts to domesticate this bird.

3. The *Common Pheasant* is kept in a semi-domesticated state in Europe, and it would seem worth while to make further experiments with that, as well as with the closely related *Grouse* and *Prairie Hen*. The latter, especially, should receive more attention from American fanciers, since there can be no question of its adaptitude to our climate, nor of its value for food. When the country was first settled it ranged from ocean to ocean; but the progress of settlement has driven it westward, until it has become extremely rare east of the Mississippi.

With regard to the rearing of pheasants a writer in the English *Live Stock Journal* says:

"Common pheasants are certainly difficult to rear, but with care a large proportion of the young ones may be brought to maturity. The eggs should be set under common hens, small sized ones being selected, and the nests should be

located either on the ground or in boxes filled with damp earth. Before the young ones are due the nest must be enclosed with boards, or anything that comes to hand, for young pheasants, unlike chickens, run away from the hen if disturbed. They must be confined to the coop for about two days by means of the 'keep,' by which time they will have learned the hen's call, and then they must be allowed their liberty, or it will be impossible to rear them. If anything alarms them they will run to the nearest bush or hedge, but will soon return if left quite alone. They may be allowed their liberty till about the time they commence moulting their tails; this is generally my guide as to when to place them in confinement. They should be fed on a mixture of meal and boiled meat, chopped fine, the more of the latter the better, and if the weather is cold or wet, mix a little pepper with the food. If they have access to grass they will require nothing more but some pure water, kept in the shade; if no grass is near they must be supplied with green food."

In France pheasants are reared in large numbers for the Paris market, and there ants' eggs are a favorite food. In default of these, meat or flour maggots are bred for the purpose.

4. The *Impeyan Pheasant*, which is a native of the Indian jungles, on account of its large size and beautiful plumage, should at least be added to the aviaries of our public parks. It is about as large as a hen-turkey; its plumage is chiefly of iridescent hues of green, steel-blue, violet and bronze, and it has a crest similar to that of the peacock.

5. The *Spruce Partridge* is a species of grouse, which was formerly common in New England, but is now seldom seen south of Canada. Its habits are very similar to those of other species of grouse.

6. The *Virginia Partridge* is a similar species, which is found in more southern localities, and has many of the habits of the common fowl, although it has been found to be less inclined to breed in confinement than the grouse; while there are various species of *quail*, which, though small in size, are worth cultivating in certain sections. A great drawback to the cultivation of these wild birds is the propensity of every fellow who can handle a gun to shoot everything that can fly, and but little headway can be made until this propensity is held in check by salutary laws.

Next to the gallinaceous birds the closely related Ostrich family would seem to be most worthy of attention. This family is represented by several species, chiefly natives of the southern hemisphere. It is of special interest to the naturalist from possessing the largest representatives of the feathered kingdom; the common ostrich sometimes attaining a height of eight feet and a weight of three hundred pounds, while remains of extinct species have been found which indicate a very much larger growth in pre-historic times. Another point of interest is that the family seems to be becoming extinct; two species, the Dodo, of Mauritius, and the Solitaire, of Roderiguez, have disappeared within comparatively recent times, and evidences are found of the existence during the present geological age of other birds probably belonging to the same family.

Whether domestication can overcome this tendency to extinction is a question not yet thoroughly settled. As previously stated, it is quite generally believed that the parent form of the Chinese goose (*Anser cygnoides*) is now extinct, and

the same is believed with regard to some other forms. This may be the case, or these forms may be the result of hybridization. At any rate the experiment is worth making of trying to preserve some of these strange birds.

The *Ostrich*: This bird, the representative of the family under consideration, is a native of tropical Africa; in its wild state it is gregarious and polygamous, the wives of one male laying in the same nest, and the male assisting in incubation, which work, however, is largely left to the heat of the sun by day, the eggs being incubated at night to preserve their warmth. This habit, however, is modified in cooler regions, where incubation is maintained continuously. Laying continues during incubation, the surplus eggs being supposed by some to be intended for the food of the young birds, but other authorities consider them merely the result of the polygamous habit of the birds, just as the laying hens in a farm-yard will lay in the nests of the sitters, if not prevented.

The ordinary food of the ostrich consists of grass, leaves and seeds, but it does not altogether reject animal food. It is noted for its propensity to swallow stones, bits of metal, pieces of leather, etc. These serve the same purpose as the smaller stones swallowed by the fowls of the farm-yard.

The wings of the ostrich, and of all birds of its family, are too short for flight, which gives them the name of *Brevipennes*; but this defect is recompensed by an extraordinary fleetness of foot, the ostrich being said to reach a speed of sixty miles an hour, while half that rate is well authenticated.

The ostriches, as well as the Cassowary and Emu, possess great strength of leg, which enables them not only to run with great speed, but to strike with powerful effect. The ostrich strikes forward, and is recorded to have disemboweled a man with a blow from its claws; while even the tiger is wary of attacking it. It only fights however, when at bay; its first impulse being flight.

The economic value of the ostrich lies chiefly in its feathers, the coarsest of which are valuable for feather-dusters, and the finer are in great demand for ornamental plumes. For these purposes the feathers are worth from one dollar to two hundred and fifty dollars per pound. The flesh of young ostriches is palatable, but that of older birds is inferior. Old birds, when fattened, yield a large quantity of oil, which is much esteemed for culinary purposes.

The domestication of the ostrich may be said to be an accomplished fact, as more than thirty-two thousand ostriches were reported as being kept in the vicinity of Cape Town in 1865. Ostrich-farms are also reported in Egypt, and they have been introduced into southern California. Since the camel has been successfully acclimated in New Mexico and Arizona it would seem probable that the ostrich might do equally well. In domestication the adults are kept to themselves by means of wire fences—one six or seven feet high being sufficient. In Cape Colony it has been found that a range of six hundred acres of grass was required for eighty ostriches; grass, when deficient, has been successfully replaced by maize.

In feathers and young the annual return of an ostrich is said to be worth \$150 to \$250; the adult birds belonging to the Khedive of Egypt were valued at \$1,000 to \$1,500 each.

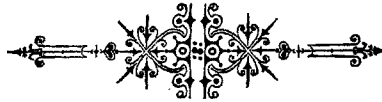
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